IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 10 November 2017

Please note: this is an archived Conservation Outlook Assessment for Wet Tropics of Queensland. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Wet Tropics of Queensland

SITE INFORMATION

Country:
Australia
Inscribed in: 1988
Criteria:
(vii) (viii) (ix) (x)

Site description:
This area, which stretches along the north-east coast of Australia for some 450 km, is made up largely of tropical rainforests. This biotope offers a particularly extensive and varied array of plants, as well as marsupials and singing birds, along with other rare and endangered animals and plant species. © UNESCO

SUMMARY

2017 Conservation Outlook

Significant concern

The Wet Tropics of Queensland World Heritage site is protected by a strong and updated legislative framework, a dedicated independent Management Authority which enjoys broad community support, and a comprehensive suite of management strategies. However, the insidious and damaging threat posed by invasive plants, animals and diseases, and the high risk posed by the predicted impacts of climate change present real danger to the continuing integrity of the site's biodiversity and associated endemic species. Whilst significant efforts have been taken to address these threats on the ground, the level of investment does not appear to be commensurate with the urgency for significant preventative and remedial action, and likely consequences, of an ineffective response.

Current state and trend of VALUES

High Concern
Trend: Deteriorating

Invasive plant and animal pest species along with a number of pathogens are impacting on World Heritage values. The trends for some threatened species seem to be deteriorating, despite recovery and action plans. The greatest concern is for the amphibian species within the property with both ancient Taudactylus spp. now presumed extinct and three others uplisted to CR, as well as montane species (birds, mammals, plants) within the property. A number of Lepidoptera are altitudinal specialists and it would be reasonable to assume high risk to these taxa also. Despite significant management responsiveness, given the sheer number and diversity of newly emerging threats, in particular biosecurity, as well as the postulated effects of climate change per se, as well as the interactions of climate change with other threatening processes; it is reasonable to assess the trend as declining.

Overall THREATS

High Threat

There are a number of current and potential threats to the World Heritage values of the Wet Tropics. Some can be mitigated with effective planning and good management, such as the pressures associated with development and increased permanent population and visitor numbers. However, other threats to the biodiversity and integrity of the rainforest, particularly the spread of invasive weeds, pest animals such as invasive ant species and plant diseases such as Myrtle Rust are much more difficult and costly to manage and more research and funding is required to better understand how to effectively mitigate these threats. The Wet Tropics of Queensland World Heritage Area is particularly vulnerable to the impacts of climate change. Climate change threatens to disrupt the finely balanced ecological and climatic conditions that support the distinctive assemblage of plants and animals and may result in rapid and catastrophic changes. Climate change is emerging as a major threat to biodiversity values and can exacerbate impacts of other threatening processes such as fragmentation, pests/weeds and changed water and fire regimes. It is anticipated there will be changes in the abundance and distribution of flora and fauna. Interactions between organisms, such as predator-prey relationships and insect pollination, are likely to be disrupted, creating consequent changes in ecosystem composition, structure and function.

Overall PROTECTION and MANAGEMENT

Mostly Effective

The WetTropics Management Plan is effective in controlling activities within the WHA that may have a detrimental impact on the Outstanding Universal Value of the property. The Wet Tropics Management Authority has a range of strategies in place that provide a sound management framework for managing tourism, walking, and conservation activities. A recently updated research strategy outlines current information needs and research priorities. WTMA has developed a comprehensive range of partnerships in the region to assist with implementing these strategies, and has constructive relationships with the eleven local governments and utility infrastructure service providers operating in the region. Codes of practice guide maintenance works in and around the area to minimize adverse impacts. The threat posed by invasive weeds, pests and pathogens,

exacerbated by predicted climate change is beyond the control of WTMA. Whilst a comprehensive range of plans are in place, the resources available to allow effective implementation are unclear, particularly with regard to managing invasive pests, weeds and pathogens. This is the main area of concern.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Superlative natural beauty**
Criterion:(vii)

The Wet Tropics exhibit exceptional natural beauty, with superlative scenic features highlighted by extensive sweeping forest vistas, wild rivers, waterfalls, rugged gorges and coastal scenery. This is particularly apparent between the Daintree River and Cedar Bay, where exceptional coastal scenery combines tropical rainforest and white sandy beaches with fringing offshore coral reefs. (SoOUV, 2012)

► **Living examples of ancient and primitive rainforest species**
Criterion:(viii)

The Wet Tropics contains one of the most complete and diverse living records of the major stages in the evolution of land plants, from the very first pteridophytes more than 200 million years ago to the evolution of seed-producing plants including the cone-bearing cycads and southern conifers (gymnosperms), followed by the flowering plants (angiosperms). As the Wet Tropics is the largest part of the entire Australasian region where rainforests have persisted continuously since Gondwanan times, its living flora, with the highest concentration of primitive, archaic and relict taxa known, is the closest modern-day counterpart for Gondwanan forests. In addition, all of Australia’s unique marsupials and most of its other animals originated in rainforest ecosystems, and the Wet Tropics still contains many of their

closest surviving members. (SoOUV, 2012)

► Unique rainforest ecosystems

Criterion:(ix)

As a centre of endemism for the region the Wet Tropics provides fundamental insights into evolutionary patterns both in isolation from and in interaction with other rainforests. Its tall, open forests on the drier western margins of the rainforest are also significant as part of an evolutionary continuum of rainforest and sclerophyll forests. Eucalypts, that now dominate the Australian landscape, are considered to have evolved from such rainforest stock and radiated into drier environments from the margins of closed forests (SoOUV, 2012).

► Exceptional biodiversity

Criterion:(x)

The Wet Tropics holds a largely intact flora and fauna with hundreds of endemic species restricted to the property, of which many are classified as threatened. The majority of plant species have restricted distributions, and many monotypic plant genera and several species of marsupials, frogs and reptiles have very restricted distributions either as isolated or disjunct populations, reflecting the refugial nature of the rainforests found in several locations. The diversity of the plant communities and animal habitats of the Wet Tropics is recognised as being the most floristically and structurally diverse in Australia and is also outstanding on a global scale. Among many emblematic species occurring in the property is the flightless Australian cassowary, one of the largest birds in the world. (SoOUV, 2012) The Wet Tropics area supports an exceptionally high level of diversity of flora, with over 3,000 vascular plant species in 224 families, of which 576 species and 44 genera are endemic, including two endemic plant families (SoOUV, 2012). In an Australian context, the Wet Tropics covers less than 0.2% of Australia, but contains 30% of the marsupial species, 60% of bat species, 25% of rodent species, 40% of bird species, 30% of frog species, 20% of reptile species, 60% of butterfly species, 65% of fern species, 21% of cycad species, 37% of conifer species, 30% of orchid species and 18% of Australia’s vascular plant species. It is therefore of great scientific interest and of fundamental importance to conservation. (SoOUV, 2012)

Although the Wet Tropics is predominantly wet tropical rainforest, it is fringed and in a few places dissected by sclerophyll forests, woodlands, swamps and mangrove forests, adding to its diversity. (SoOUV, 2012) There are 113 species of reptiles in the Wet Tropics area which 24 species are endemic, including three monotypic endemic genera (SoOUV, 2012). The diversity of amphibians in the Wet Tropics includes 51 species of which 22 are endemic. (SoOUV, 2012) There are 107 mammal species in the Wet Tropics Area including 11 endemic species and two monotypic endemic genera (SoOUV, 2012). There are 368 bird species, of which 11 species are endemic.(SoOUV 2012)

Other important biodiversity values

► **Irreplaceability**

In 2013, the Wet Tropics of Queensland World Heritage Area was assessed as the second most irreplaceable natural World Heritage site currently included on the World Heritage List. The irreplaceability rank indicates the relative importance of a site among 173,461 protected areas for all the species analyzed http://www.iucn.org/about/work/programmes/wcpa_worldheritage/resources/publicatio

Assessment information

Threats

Current Threats

Very High Threat

The on-going and increasing impact of invasive animal and plant species and diseases, such as Myrtle Rust, together with the predicted impacts of climate change, and the potential future risk of invasive ecosystem engineer, Yellow Crazy Ants, pose a real and significant threat to the World Heritage values of the Wet Tropics over the longer term. These threats are the target of mitigation

efforts by the managing authorities and community groups, which have had some limited success but which will require extra effort and funding over the long term to be effective. The Wet Tropics of Queensland World Heritage Area is particularly vulnerable to the impacts of climate change. Climate change (will likely have severe and interacting effects on the Outstanding Universal Value of the Area, particularly on animals with low temperature range tolerances and montane flora and fauna. It is anticipated there will be large changes in the abundance and distribution of flora and fauna. Interactions between organisms, such as predator-prey relationships and insect pollination, are likely to be disrupted, creating consequent changes in ecosystem composition, structure and function.

► Storms/Flooding

High Threat
Inside site, throughout(>50%)
Outside site

The projected impacts of climate change are a serious concern (SoWT Report 2015/2016 p39). The conservation strategy lists high priorities, and recognizes that new avenues of funding are needed to support implementation of the strategy. WT Cons strategy 2005 pvii), but the projected impacts of Climate Change are dire (SoWT Report 2015/2016 p55), and will require extremely active management, high responsiveness and flexibility that may not be possible with existing capacity, which is mainly directed towards visitor and weed management. Severe tropical cyclone Yasi caused extensive damage in February 2011. Cyclone intensity is predicted to be even greater, creating risks of more frequent major ecosystem disruption (SoWT Report 2007/08).

► Housing/ Urban Areas

Low Threat
Outside site

It is predicted that some ~298,000 people will live in the Wet Tropics and Tablelands region by 2017 (274,116 in 2010, 2.9% growth; Tourism opportunity report 2011-2020; (Queensland Government 2011). In the broader region, the estimated resident population is forecast to exceed 700,000 by 2031. Increased tourist numbers are also expected from the estimated level of 5.7 million visits in 2010 (SoWT Report, 2012 p76), with

growth in visitation~14% per annum (Queensland Government 2011). This leads to greater demand for water for domestic, agriculture and industrial uses, and for improved community service infrastructure that could lead to greater fragmentation of the rainforest. If development is managed in a sustainable way, it should not significantly impact the values of the Area.

► Logging/ Wood Harvesting

Low Threat
Inside site, scattered(5-15%)
Outside site

Prior to in the inscription of the property on the World Heritage List in 1988 the rainforests were subject to extensive timber harvesting. 6,500 km logging roads closed since its inscription (WT Periodic Report 2003 p10). Rehabilitation of disused roads is identified as a priority. (Cons strategy 2004 p 52). No major forest loss has been documented since 1991 (Reside et al 2017).

► Roads/ Railroads

Low Threat
Inside site, extent of threat not known
Outside site

There are presently 1,217 kilometres of maintained vehicle roads and tracks in the WTWHA which are classified and managed consistent with the statutory Wet Tropics Management Plan (SoWT Report 2008-09).

► Invasive Non-Native/ Alien Species

Very High Threat
Inside site, throughout(>50%)
Outside site

Invasive species and climate change may result in rapid and catastrophic changes that increasingly threaten the region’s flora and fauna and ecological systems . (SoWT Report 2010/11 p54). Invasive species such as pigs, tramp ants and weeds (now over 500 species) as well as plant diseases such as Myrtle Rust pose a threat to biosecurity and to the values of the Wet Tropics Area. A small number of newly emerging weed species such as Miconia, Mikania and Limnocharis are of extreme management concern. Phytophthora cinnamomi threatens hundreds of endemic species. (SoWT

Report, 2010/11 p54). Tilapia is rapidly invading rivers and water bodies (SoWT Report 2010/11). The full impact of many of these invasive species isare yet to be seen. These diseases and pests are difficult to manage and pose a very significant threat to the biodiversity and ecological integrity of the Wet Tropics if not contained. New invaders are continually arriving and taking hold (SoWT Report 2010/11 p55). Management capacity and level of resources are insufficient to meet these threats. Priority needs to be given to prevention as management of incursions is too costly. It is important that all levels of government invest substantial funding to Wet Tropics biosecurity (SoWT Report 2010/11 p55).

► Livestock Farming / Grazing

Low Threat
Inside site, scattered(5-15%)
Outside site

In 2003, there were 30 grazing properties that made up approximately 8% of the Wet Tropics World Heritage Area. Policy has been in place to phase out grazing as leases expire (Cons strategy 2004 p67). The longest running lease will expire in 2051. However, not all these grazing leases are used to run cattle. The list includes a large special lease for grazing south of Paluma used by the Commonwealth of Australia for Defence purposes, two properties run by the Australian Wildlife Conservancy and Bush Heritage for conservation purposes, and one bought and operated by the Queensland Government. There are also three larger special leases in the area covered the Eastern Kuku Yalanji Indigenous Land Use Agreement which have expired (they make up 15,046ha or 1.68% of the property). New leases may be issued over a reduced area when an application is made by the traditional owners, however, any grazing will be subject to approval by the Authority under a Cooperative Management Agreement.

► Tourism/ visitors/ recreation

Low Threat
Inside site, scattered(5-15%)
Outside site

Visitor numbers to tropical north Queensland are increasing steadily with 2,043,000 domestic visitors and 860,000 international visitors making a total of 2,903,000 in 2015-16 (Source: Tourism Research Australia). Wet Tropics

Nature Based Tourism Strategy provides for focused access to designated visitor sites, managing visitor pressure. Tourism industry is recognized as a key regional partner and engaged through the Tourism Industry liaison Group. A high proportion of operators are certified through Ecotourism Australia. (SoWT Report 2011/12 p77). Tourism is cited as a propriety of both the WTMA (SoWT Report 2015) and the State (Tourism Opportunity Report 2010), but staff capacity may be insufficient to manage this growth (unpublished data, Craigie et al).

► Crops, Livestock Farming / Grazing, Marine/ Freshwater Aquaculture

Low Threat
Inside site, extent of threat not known
Outside site

There is significant agriculture surrounding the Wet Tropics Area, (2500 individual blocks) and grazing is permitted outside of the rainforest in a rural parcels (SoWT Report, 2012, p. 58). Neighbours and landholders have cooperated with the Authority and other organisations such as Terrain NRM to develop toolkits for best practice on private properties.

► Habitat Shifting/ Alteration

Very High Threat
Inside site, throughout(>50%)
Outside site

Predicted climate change exceeds the rate and scope of historical climate fluctuations (SoWT Report 2014/5). Climate change threatens to disrupt the finely balanced ecological and climatic conditions that support the distinctive assemblage of plants and animals that exist in the Area and may result in rapid and catastrophic changes (SoWT Report 2010/11 p54). Climate change is emerging as a major threat to biodiversity values and can exacerbate impacts of other threatening processes such as fragmentation, pests/weeds and changed water and fire regimes. Species living at high altitudes with limited thermal tolerances, such as the Green Ringtailed possum, will be particularly susceptible. (Cons Strategy 2005 p55/56). The biodiversity of the Wet Tropics is threatened due to predicted changed weather patterns which could seriously affect plant and animal species vulnerable to a warmer and more variable climate, and changes in cloud levels and associated water cycles. Climate change also poses the risk of more frequent and intense

cyclones and flooding, with associated disruption to ecosystems. (SoWT Report, 200/11; Krockenberger, Kitching, and Turton, S. M., 2003). Taudactylus acutirostris and T. rheophilus are both now likely to be extinct (SoWT Report 2014/5). Of remaining ancient and unique taxa the golden bowerbird and green ringtail possum are among the species most vulnerable to climate change (SoWT Report 2014/5).All mountaintop endemic plants likely to qualify as CR now under the IUCN red list criteria (http://www.wettropics.gov.au/rainforest-at-risk.html). Recent draft EPBC frog and reptile assessments also list all mountaintop endemics as at risk. The majority of species listed under OUV “have low resilience and are concentrated in the stable upland refugia”, (SoWT Report 2014/5), making them highly vulnerable to change, and extinction.

► Invasive Non-Native/ Alien Species

Very High Threat
Inside site, extent of threat not known
Outside site

The yellow crazy ant (YCA) has become established in two locations within the Wet Tropics. YCA were first detected in 2012. They are general omnivorous feeders with versatile nesting habits, and are capable of locating suitable food and nesting sites within any area that they invade. These traits allow the YCA to build up to high densities, form super-colonies, and become the most common consumer over large areas on both the ground and in the forest canopy disrupting and transforming ecosystems. YCA are a serious environmental and agricultural pest, recognised among the world’s 100 most invasive species. Based on impacts elsewhere, the ecology of the ants, small amounts of research in the region, and estimations, researchers anticipate that if the invasion is thorough, much of the Wet Tropics fauna will be affected. The potential for knock-on effects in a system as complex and interconnected as the Wet Tropics rainforest is very high (SoWT Report 2014/5).
Yellow crazy ants have invaded over 200 hectares of rainforest in and adjacent to the Wet Tropics World Heritage Area near Cairns and Kuranda and over 500 hectares of adjacent residential land and cane farms. As dry events become more frequent YCA establishment may be exacerbated (Parks Australia and LaTrobe University 2015)
https://www.ehp.qld.gov.au/state-of-the-environment/finding/?id=2.3.2.3

http://www.wettropics.gov.au/stamp-out-yellow-crazy-ants.html
(SoWT Report 2014/5)
The Authority received $1.99 million (Commonwealth Caring for our Country Target Areas Grant over 5 years 2013-18); plus $3.039 million Queensland State Government funds over 3 years 2016-19); and $7.5 million Commonwealth National Landcare Program over 3 years 2016-19). Progress on surveillance, monitoring, delimitation and treatment activities increased considerably with additional funding, making 2017 the most productive for on-ground activities and the most significant for revealing ant activity throughout the area. Results to date have shown significant reduction in ant activity following treatment rounds.

Potential Threats

Low Threat

A growing urban population in the Wet Tropics region and continuing high levels of tourism will put extra pressure on land, and water,. With appropriate planning and management these impacts should be minimized. The WTMA works closely with landholders, local and state government agencies to manage these impacts. The continuing popularity of the WHA as a major tourism destination, and its promotion by the WTMA, State and Federal government will see increasing pressure for visitor infrastructure in and around the WHA, with a number of planned facilities.

► Tourism/ visitors/ recreation

Low Threat
Inside site, widespread(15-50%)

A growing urban population in the Wet Tropics region and continuing high levels of tourism will put extra pressure on water and land resources, potentially affecting the Outstanding Universal Values. With appropriate planning and management these impacts should be minimized. (Zoning Rules and Proposed changed for the 2017 management plan review. WTMA, 2017. http://www.wettropics.gov.au/wet-tropics-plan-review).

► Fire/ Fire Suppression

Data Deficient
Inside site, extent of threat not known

Outside site

The increase in temperature, and therefore evaporation, increasing dry season length and severity, and increasingly open canopies from high intensity cyclones has the potential to vastly increase fuel loads, fire danger and frequency—potentially triggering structural, floristic and faunal changes to entire ecosystems. This carries a risk of fire becoming a real threat to the rainforest (SoWT Report 2014/5).

► Droughts

High Threat
Inside site, throughout(>50%)
Outside site

Predicted effects of climate change will increase frequency of droughts and associated hot fires allowing weeds such as guinea grass and molasses grass to establish, changing the seasonality and intensity of ground fires when they dominate ground cover (Cons strategy 2005 p75). Preliminary evidence from Christmas Island suggests drying events may facilitate Yellow Crazy Ant supercolonies, so this is a possible emerging risk (Parks Australia and LaTrobe University 2015).

Protection and management

Assessing Protection and Management

► Relationships with local people

Highly Effective

The WTMA has partnerships with a range of government, scientific, tourism, Aboriginal and non-government organisations (SoWT Report 2012, p. 5).
It has established a comprehensive system of advisory committees representing major stakeholder interests, specifically tourism sector, conservation sector and landholders and neighbours. The Cassowary Awards recognize individuals and groups that make a special contribution to looking after the WHA. (SoWT Report 2011/12 p59)

► Legal framework

Highly Effective

The Wet Tropics World Heritage Protection and Management Act 1993 (Current version 2012) provides a comprehensive legal framework and outlines the management responsibilities of the various state authorities. The Act also establishes WTMA to ensure that Australia's obligation under the World Heritage Convention is met in relation to the WTWHA. The Act sets down the functions of WTMA and provides the head of power for making statutory management plans for regulation of activities that may impact on the integrity of the WTWHA.
The Wet Tropics World Heritage Area Management Scheme1990 is an intergovernmental agreement between the Commonwealth and Queensland governments and provides the basis for both tiers of government working together. It was amended and adopted in 2011.

► Enforcement

Data Deficient

Data deficient.

► Integration into regional and national planning systems

Some Concern

The Far North Queensland Regional Plan 2009–2031, prepared under Queensland's Sustainable Planning Act 2009, has included broad scale mapping of biodiversity, strategic rehabilitation areas and corridors. However, these areas need to be mapped at a finer scale when included in mapping local government planning schemes to represent effective "constraints" to development. Planning codes are also required to regulate development and land use (Maclean, A. (2012) Submission to Department of Sustainability, Environment, Water, Population and Communities on the Draft National Wildlife Corridors Plan)
On 8 October 2012 the Queensland government released the draft Coastal Protection State Planning Regulatory Provision (the SPRP) that sets out requirements for coastal protection in Queensland.
This SPRP suspends the operation of State Planning Policy 3/11: Coastal Protection (the legislative 'teeth' of the Queensland Coastal Plan) as well as

part 1.2 Coastal Management of the Far North Queensland Regional Plan 2031.
Bohnet I. and Pert P. (2010) create a prospective land use change analysis for Cairns and show that if the proposed urban footprint for 2031 is implemented; the loss of important habitats including areas of high ecological significance within the urban footprint is highly likely. (Landscape and Urban Planning 97, 4, 30 September 2010)

► Management system

Some Concern

The 1998 Management Plan is currently undergoing stakeholder consultation as part of a multi stage updating process. The Wet Tropics Management Plan (1998) effectively controls activities within the Area that might impact on WH values. The Wet Tropics Management Authority management system framework is established under the Act. The Act establishes the Wet Tropics Ministerial Council, a board of directors, a community consultative committee and a scientific advisory committee. A 5-year strategic plan, which is current to 2018 also provides direction and priorities for management. WTMA provides an annual assessment on the State of the Wet Tropics with its annual report. The Wet Tropics Management Authority has worked closely with state government agencies (particularly the Queensland Parks and Wildlife Service), Terrain Natural Resource Management, the Far North Queensland Regional Organisation of Councils (FNQROC), community conservation groups, private landholders and Traditional Owners to promote ecological connectivity across the broader landscape. Relationships appear to be positive and well established. (SoWT report 2011/12 p56-59) The Wet Tropics Conservation Strategy (WTMA 2004) lists a broad range of corridor priorities across the bioregion and emphasises the many different benefits of each corridor, including ecological connectivity, climate change adaptation, and wildlife movement for threatened species such the cassowary and mahogany glider. The Wet Tropics Conservation Strategy also addresses biosecurity issues that threaten the integrity of the WTWHA such as yellow crazy ant and myrtle rust. The Nature based Tourism strategy 2000 provides a strong framework for managing tourism. The Walking Strategy establishes an extensive network of walking opportunities across the Area. An updated Research strategy 2010 identifies information needs and establishes research priorities. Conservation and land management priorities are largely

reflected in the Terrain NRM Regional Plan. Capacity for implementation of these various strategies is not clear and is heavily dependent on government funding. Conservation and land management priorities are largely reflected in the Terrain NRM Regional Plan. Capacity for implementation of these various strategies is not clear and is heavily dependent on government funding. The ability of the management plan to manage biosecurity risks, including management of Class I and other pests and weeds, is unclear.

► Management effectiveness

Mostly Effective

The legislative framework provides an effective framework for control of development that may impact on WH values. Annual reports of WTMA and Terrain NRM (2012) indicate that progress is being made in implementing various strategic plans, but that progress is constrained by limited resources. The financial and personnel commitments deployed for environmental pests, weeds and diseases and the level of urgency in responding do not match the effectiveness in responding to threats to human health and agricultural biosecurity risks. (SoWT Report 2010/11 p77). The capacity to effectively address invasive pests, and weeds, alongside pathogens such as Myrtle Rust, is thus limited. Emergency Yellow Crazy Ant funding has been obtained from federal sources, but appears insufficient for eradication. The projected impacts of climate change are a serious concern. The conservation strategy lists high priorities, and recognizes that new avenues of funding are needed to support implementation of the strategy. WT Cons strategy 2005 pvii), but the projected impacts of Climate Change are dire, and will require extremely active management, high responsiveness and flexibility that may not be possible with existing capacity, which is mainly directed towards visitor and weed management.

► Implementation of Committee decisions and recommendations

Highly Effective

At 12 COM.XIXA.1988 the WH Committee decided to inscribe the Wet Tropics on the World Heritage List and recommended an appropriate management regime be established. Decision 16COM.WIII 1992 noted with satisfaction that much progress had been made. In 1998 the WH Bureau at its 22nd session learnt that action had been taken regarding vegetation clearance within the

WHA, and were later advised that the statutory Management Plan, which provides WTMA with the full suite of powers to act in the interests of WH values was effective from 1 Sept 1998.

► Boundaries

Mostly Effective

Boundaries are secure. The WTMA is subject to clear zoning described in the management plan. While there is no buffer zone, the Commonwealth's Environment Protection and Biodiversity Conservation Act 2000 comes into play were a development proposal may have a significant impact on a World Heritage property. However, amendments to the Sustainable Planning Regulation 2009 in 2013 mean local governments are no longer required to consult with WTMA regarding development applications within 100m of the boundary involving a reconfiguration of a lot or a substantive change of use (IUCN Consultation, 2014).

► Sustainable finance

Some Concern

Funding to WTMA is provided through an agreement of the Queensland and Australian governments (Wet Tropics World Heritage Protection and Management Act 1993). This enables core functions to be undertaken. Separate funding is provided to Queensland National Parks for management of national parks within the WHA. Base funding from the Commonwealth and Queensland governments appears to be stable (WT Annual report p43). This is supplemented by access to a range of government grants, usually in partnership with community organisations. Whilst funding appears adequate to maintain basic management functions, additional funding is required for an effective response to the threats posed by invasive weeds, pests and diseases, all of which are likely to be exacerbated by predicted climate change. Ideally, such funding should be on-going rather than being subject to regular funding bids to ensure sufficiently flexible and rapid responses.

► Staff training and development

Highly Effective

WTMA has a small staff focused on policy, planning, community engagement and regulation. Land management activities are undertaken primarily by

QPWS and other landholders within the Area. WTMA hosted an intensive training program for staff from WH sites in the Solomon Islands, PNG, Vanuatu and Kiribati (WT Annual report 2011/12 p41). WTMA allocates approximately 2% of salaries component each year to staff training and development. Training needs are identified according to capacity-building needs identified in the 5-year strategic plan.

► Sustainable use

Highly Effective

The Wet Tropics Management Plan controls activities that may impact on World Heritage values within the WH area. The Nature-base Tourism Strategy 2000 and Walking Track strategy provide a framework for sustainable recreational use of the WHA. The annual gross economic value of tourism directly generated by the WHA is estimated at $426 million. (Economic Values of Tourism in WTWHA Prideaux and Falco-Mammone 2007 p ix). Other than exercise of Native Title rights, exploitive use of natural resources requires assessment and a permit by WTMA under the Management Plan. Two water supply dams exist within WHA at Copperlode Falls and Paluma dam. Eight Local Authorities have 22 intakes with associated infrastructure. Focus for additional water supplies now outside the WHA (WT Periodic Report 2003 p38). Any new water supply within the WHA would require assessment and a permit under the Management Plan. The issue of sustainable use could be addressed more clearly in the Management Plan.

► Education and interpretation programs

Highly Effective

WTMA has been engaged in a number of education activities ranging from hosting training programs from other WH sites to providing stories, feature articles and activities for school students across the region. SoWT Report 2011/12 P 75). One of the Strategic activities being undertaken by the WTMA is to produce a suite of communication products and services that educate the public, and enable understanding and appreciation as well as access and enjoyment of the World Heritage Area (Wet Tropics Strategic Plan, 2012). This includes collaboratively developing culturally accessible materials for indigenous people, a range of products for schools.

► Tourism and visitation management

Highly Effective

The Wet Tropics WHA is a premium tourism destination. There were an estimated 5.7 million visitors during the year ending 2010. (SoWT report 2011/12 p76). The Nature-based tourism strategy 2000 provides the framework for managing tourism, and the tourism industry is recognized as a key partner in assisting in the interpretation and presentation of the WHA. A specific Wet Tropics tour guide training program has been developed in partnership with the Queensland Tourism Industry Council. Tourism operators in the Wet Tropics are amongst the leaders in sustainable eco-tourism, with 159 products accredited by Ecotourism Australia that operate in north Queensland (SoWT Report 2011/12 p76/77; SoWT Report 2014/5, p12).

► Monitoring

Highly Effective

Under the Wet Tropics World Heritage Protection and Management Act, WTMA must produce a report on the State of the Area each year. The Research Strategy 2010 outlines baseline information against which to measure environmental changes, trends and impacts. (WTMA Annual Report 2010/11 p31). The research strategy also identifies priorities for Understanding the Condition and Trends of the Natural and Cultural Environment, recognizing the need to improve understanding of the condition, trend and interdependencies of the natural and cultural environments including methods to support ongoing regular assessment and reporting. (Research Strategy 2010 p23). A Periodic Report was completed for the World Heritage Committee in 2011. Total amount of investment in monitoring is unclear, and long term monitoring support has declined (SoWT 2015/6 p4) Despite this monitoring continues detecting recent and ongoing species declines that specifically impact the Outstanding Universal Value of the Wet Tropics World Heritage Area, and resulting in new conservation opportunities – for instance the rediscovery of the armoured mist frog in previously unknown habitats resulting in new translocation opportunities.

► Research

Highly Effective

A new research strategy was completed in 2010 . This identifies key research needs and builds a foundation for establishing the WHA as an internationally-recognised learning landscape (WTMA Annual Report 2010/11 p8). The region has rapidly developed its research capacity in rainforest ecology and management through successive Australian Government investments through the Rainforest CRC, Marine and Tropical Science Research Facility, Tropical Ecosystems Hub of the National Environmental Research Programs. At present the National Environmental Science Program (NESP) has been supporting the Threatened Species Recovery and Tropical Water Quality Hubs, which both conduct some research relevant to the Wet Tropics WHA. Biosecurity Research was previously supported by the Weeds CRC. WTMA has been an active collaborating research-user partner, currently through the National Environmental Research Program. The Research strategy clearly communicates information to research institutions on information needs and priorities for research. Research institutions have shown that they are able to respond to this research agenda with funding support.

Overall assessment of protection and management

Mostly Effective

The WetTropics Management Plan is effective in controlling activities within the WHA that may have a detrimental impact on the Outstanding Universal Value of the property. The Wet Tropics Management Authority has a range of strategies in place that provide a sound management framework for managing tourism, walking, and conservation activities. A recently updated research strategy outlines current information needs and research priorities. WTMA has developed a comprehensive range of partnerships in the region to assist with implementing these strategies, and has constructive relationships with the eleven local governments and utility infrastructure service providers operating in the region. Codes of practice guide maintenance works in and around the area to minimize adverse impacts. The threat posed by invasive weeds, pests and pathogens, exacerbated by predicted climate change is beyond the control of WTMA. Whilst a comprehensive range of plans are in place, the resources available to allow effective implementation are unclear, particularly with regard to managing invasive pests, weeds and pathogens. This is the main area of

concern.

▶ **Assessment of the effectiveness of protection and management in addressing threats outside the site**

Mostly Effective

WTMA has built constructive relationships with the eleven Local Governments which include parts of the WHA, and works in partnership with the regional community to build a sense of ownership and sharing the benefits and burdens of sound management (WT Annual Report 2011/12 p13). WTMA provides advice on development proposals outside the World Heritage Area that may affect WH values, and continues to provide advice into Local Government Planning schemes. WTMA also works closely with landholders, local governments and other service providers to manage infrastructure and improve weed and feral animal control (WT Annual Report 2011/12 p21). There is a close collaboration with Terrain, the regional NRM body that promotes and funds good land management practices in the region, often on land close to the WHA. A broad range of habitat corridor priorities identified in the WT Conservation strategy are incorporated in the Terrain Regional NRM Plan. (SoWT Report 2011/12 p67) The Authority is engaged with a number of local conservation and NRM groups in improving connectivity in the Southern Atherton Tablelands to help build resilience to climate change (WT Annual report 2011/12 p23). Given the recent discovery of species that contribute to OUV (Armoured mist frog) in boundary areas, it will be critical to ensure that threats to these newly discovered populations, are also addressed and access to lands that hold potential for further rediscovery targeted.

▶ **Best practice examples**

Maclean, A. (2013) Wet Tropics of Queensland. Sharing best practices. In: World Heritage and Best Practices. World Heritage 67: 24-30

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Superlative natural beauty

Good
Trend:Stable

Despite the threats to biodiversity and the fragmented nature of the Wet Tropics, it is still an area of outstanding natural beauty (SoWT Report, 2012). Codes of practice apply to Local Government and utility agencies that seek to minimize impacts from maintenance of community infrastructure. Whilst extreme weather events such as cyclone Yasi in 2011 have dramatic visual impacts through extensive damage to vegetation, these effects are part of the natural cycle and are comparatively short-lived. There is no evidence that scenic beauty is being affected at this stage. The scenic beauty is affected by coral bleaching events.

► Living examples of ancient and primitive rainforest species

High Concern
Trend:Deteriorating

An assessment of the current state is that there has been some loss or alteration of the elements necessary to maintain the site’s values over the 25 years since the property was listed, in particular with respect to frogs, and in particular with respect to the genus Taudactylus, one of the most primitive groups of frogs in Australia. Both Wet Tropics spp. are now presumed extinct after extensive recent surveys (SoWT 2015/6). The trend over the last five years is still considered to be deteriorating for 6 of 8 spp. of endemic rainforest stream-dwelling frogs. There are strong indications that cool adapted upland possum species, such as the ancient lineage Green Ringtail Possum, Tooth Billed bowerbird, and others are being adversely impacted by small changes in climatic conditions (SoWT 2015-6.
For the majority of plants, the assessment rating would be ‘data deficient’ – there is no evidence, nor data, which indicates that their condition or conservation status has changed since inscription (IUCN Consultation, 2014). However, 13 of 19 montane endemic plants with sufficient data to model are projected to be extinct by 2080, and likely all montane endemic plants qualify as CR under the IUCN Red List Criteria (Costion 2014). Data needs to be collected over a longer period of time to detect trends in most of the

elements relating to this value (i.e. living examples of ancient and primitive rainforest species of plants).
A re-evaluation of the EPBC and red-list status of Reptiles and Amphibians is proceeding at present, and the process identified Montane reptiles and amphibians as at risk (Hoskins, pers comm).
Given these trends, it is reasonable to assess this value as deteriorating.

► Unique rainforest ecosystems

High Concern
Trend:Deteriorating

The region is very susceptible to invasion by a broad range of invasive species. The highly restricted nature of many endemic species renders them particularly vulnerable to the threat posed by invasive species. This threat is exacerbated by the predicted impacts of climate change as well as on-going fragmentation of the Area and consequent loss of habitat connectivity (SoWT Report, 2012). However, even though there are over 500 invasive species recorded as being naturalized for the bioregion, most of these are ruderal in nature and only invade cleared or highly disturbed areas such as road verges and agricultural lands. There are a small number of invasive species that are capable of invading intact rainforests. There has been a disturbing newly emerging trend of species with the potential to invade and transform intact ecosystems becoming introduced to the bioregion. Some of these newly emerging threats include plant species such as Miconia, fish species such as tilapia, and tramp ant species such as the yellow crazy ant. The trends for some threatened species seem to be deteriorating, despite recovery and action plans. The greatest concern is for the amphibian species within the property, although declines in range extent and population sizes of a number of high altitude bird and mammal species have also been reported. However more monitoring data is needed to confirm this. In addition, if the number and distribution of invasive species including pathogens continue to increase, natural ongoing evolutionary processes are likely to be compromised.
Although many biodiversity values are being well conserved in the site, the growing trend of increasing prevalence of global threats is of concern (IUCN Consultation, 2014).

► Exceptional biodiversity

High Concern
Trend:Deteriorating

There are significant threats to the biodiversity of the Wet Tropics posed by invasive species and diseases, exacerbated by predicted climate change. Some of these are hard to manage and there is evidence that the number of weed species is expanding (SoWT Report, 2012). The loss of habitat such as the littoral rainforest and impact on dependent species such as the Cassowary and Mahogany glider would reduce conservation values of the Wet Tropics. Endemic stream-dwelling frog species have disappeared from the higher altitude parts of the Wet Tropics due to infection with chytrid fungus resulting in chytridiomycosis (IUCN Consultation, 2014). The yellow crazy ant (YCA) has become established in two locations within the Wet Tropics. The infestation area continues to spread but eradication efforts have been underfunded and so far unsuccessful. As dry events become more frequent YCA establishment may be exacerbated (Parks Australia and LaTrobe University 2015).

Summary of the Values

► Assessment of the current state and trend of World Heritage values

High Concern

Trend: Deteriorating

Invasive plant and animal pest species along with a number of pathogens are impacting on World Heritage values. The trends for some threatened species seem to be deteriorating, despite recovery and action plans. The greatest concern is for the amphibian species within the property with both ancient Taudactylus spp. now presumed extinct and three others uplisted to CR, as well as montane species (birds, mammals, plants) within the property. A number of Lepidoptera are altitudinal specialists and it would be reasonable to assume high risk to these taxa also. Despite significant management responsiveness, given the sheer number and diversity of newly emerging threats, in particular biosecurity, as well as the postulated effects of climate change per se, as well as the interactions of climate change with other

threatening processes; it is reasonable to assess the trend as declining.

Additional information

Benefits

Understanding Benefits

- **Carbon sequestration, Water provision (importance for water quantity and quality)**

  The rainforest acts as a significant carbon sink, helping to mitigate the effects of climate change caused by greenhouse gas emissions. It also provides soil stabilization and provides a clean water supply to the local region.

- **Importance for research**

  The Wet Tropics is an area of high biodiversity which makes the ecosystems of this Area important for scientific research, including efforts to develop new medicines.

- **Outdoor recreation and tourism**

  The Wet Tropics Area provides the local population with the public goods of clean air and water, giving them health and well-being benefits. The area is widely accessed for outdoor recreation, and is visited extensively by domestic and international tourists. The Wet Tropics is a large area that provides great aesthetically beautiful landscapes as well as opportunities to view wildlife and ancient plant species.

- **History and tradition, Sacred natural sites or landscapes**

  The Wet Tropics World Heritage Area is culturally rich, comprising the traditional lands of 20 Rainforest Aboriginal groups. The Wet Tropics Area is an area of immense cultural importance for rainforest Aboriginal people. It is

listed on the National Heritage register for Cultural values. The Area also holds wilderness values that are inherently important for many people.

► Outdoor recreation and tourism

The beauty of the Wet Tropics Area brings millions of visitors to the region every year, proving the basis for a major tourism industry and a large number of jobs servicing visitors and in the management of the Area.

Drying and invasive species have also the potential to affect the aesthetic values of the area. YCA poses substantive risks to ecosystem function if it establishes. In addition to impacts directly on the WHA, many visitors come for the dual spectacle of the rainforest and the reef which is also at high risk under climate change.

Summary of benefits

The Wet Tropics Area provides very substantial environmental cultural, spiritual, health, well-being and economic benefits to the local population and is of considerable significance to the wider global community in terms of wilderness values, outdoor recreation, scientific research value and the environmental services provided by the rainforest.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects

1	WTMA, Tablelands Regional Council (TRC), Conservation Volunteers Australia (CVA), Trees for Evelyn and Atherton Tablelands (TREAT), the Tree Kangaroo and Mammal Group (TKMG), Malanda Landcare, QPWS, Griffith University and University of Queensland.	From: 2017 To: 2017	In 2010 the Authority was successful in securing $600,000 from the Australian Government's Caring for Our Country initiative for a project referred to as 'Making Connections: Building Landscape Resilience to Climate Change in the Wet Tropics Landscape'. Scientific modelling has shown that improving connectivity in the cool, high areas of the Southern Atherton Tablelands could help build the resilience of the region to climate change and provide a refuge for the unique plants and animals of the Wet Tropics that are sensitive to rising temperatures. With the assistance of the QPWSin facilitating relationships with landholders and contractors, nearly 19,000 trees of over 100 species have been planted along Rock Road andEast Evelyn Road by TRC, CVA's Better Earth programme and more than 120 volunteers from the School for Field Studies and community groups like TREAT and TKMG. To date, 6.5 hectares have been replanted, and over 2.5 kilometres of fencing has been erected to protect plantings from cattle.
2	Terrain NRM, Hinchinbrook Shire Council (HSC), Herbert Cane Productivity Services, Forestry Plantations Queensland, and Queensland Parks and Wildlife Service, other local governments	From: 2017 To: 2017	1,525 pigs killed as part of a critical and coordinated pest management partnership in Cassowary Coast and Hinchinbrook between Terrain and local governments, land managers and government agencies.
3	Terrain NRM, Mulgrave Landcare and Catchment Group, Hinchinbrook Shire Council,	From: 2017 To: 2017	Weed control efforts in many areas, including six year $740,000 Biodiversity Fund project, for corridor restoration and Weeds of National Significance (WONS) control in the Mulgrave catchment.
4	Terrain NRM, Australian Centre for Freshwater Research, local governments, Queensland Government	From: 2017 To: 2017	Development of the Wet Tropics region Healthy Waterways Management Plan, due to be completed in 2013.

5	Terrain NRM, Australian Government Caring for Our Country	From: 2017 To: 2017	Programs to protect endangered species (eg. Cassowary, Mahogany glider) in the Tully, Murray and Herbert catchment areas. Recovery Plans may be developed for threatened animals, plants and ecological communities listed under the Environment Protection and Biodiversity Conservation Act 1999. They set out the research and management actions necessary to stop the decline of a species and how to support its recovery. Recovery Plans have been developed for the following species and vegetation communties: • cave-dwelling bats (Rhinolophus philippinensis, Hipposideros semoni and Taphozous troughtoni) • giant filmy fern (Chingia australia) • Mabi forest • magnificent broodfrog • mahogany glider • northern bettong • stream dwelling rainforest frogs of the Wet Tropics (sharp-snouted day frog, northern tinker frog, armoured mistfrog, waterfall frog, mountain mistfrog, common mistfrog and Australian lacelid. • southern cassowary • spectacled flying fox • spotted-tailed quoll
6	Cooperative effort between the Australian and Queensland governments.	From: 2017 To: 2017	The National Four Tropical Weeds Eradication Program commenced in 2002 with the aim of eradicating the incursions of Koster’s curse, limnocharis, mikania vine and three miconia species in the Wet Tropics from Australia. The nationally coordinated program is managed and operated by the Queensland Government. The program involves extensive community engagement to identify infested areas, targeted weed surveys and weed control, and research components. The only recorded infestations of these four weeds in Australia currently occur in the Wet Tropics of Queensland.
7	Drying and invasive species have also the potential to affect the aesthetic values of the area. YCA poses substantive risks to ecosystem function if it establishes. In addition to impacts directly on the WHA, many visitors come for the dual spectacle of the rainforest and the reef which is also at high risk under climate change.	From: 2017 To: 2017	The Authority has received nearly $2 million from the Australian Government from 2013 - 18 to reduce the threat of yellow crazy ant infestations. Additional funding of up to $7.5 million was approved in early 2017 as a one-off grant to the Authority to support eradication of yellow crazy ants, but this is less than the estimated cost of eradication.

8	Australian Government - Threatened Species strategy	From: 2017 To: 2017	A small investment of $200 000 has been provided for management support at Mt Lewis, Mt Spurgeon and Mt Windsor – known hotspots for threatened and endemic species, particularly mammals - focused on managing fire.
9	Australian Government - Threatened Species strategy	From: 2017 To: 2017	$6 million in projects that directly protect and restore Southern Cassowary Habitat have been provided, but since the main threatening process appears to be road deaths, it is unclear what this will achieve.
10	Australian Government - Threatened Species strategy	From: 2017 To: 2017	$30 000 toward connecting habitat to link isolated populations of mahogany gliders.
11	Department of National Parks, Sport and Racing and Department of Environment and Heritage Protection	From: 2017 To: 2017	Contribution from the Queensland Government to achieve world Heritage Outcomes through the Department of National Parks, Sport and Racing (c.a. $10 million/ annum) or Department of Environment and Heritage Protection
12	CFOC program	From: 2013 To: 2017	CFOC program to deliver WH outcomes through conservation projects ($13.5 million over 5 years between 2013-18).

REFERENCES

№	References
1	BOHNET, I. C. & PERT, P. L. 2010. Patterns, drivers and impacts of urban growth—A study from Cairns, Queensland, Australia from 1952 to 2031. Landscape and urban planning, 97, 239-248
2	COSTION, C. M., EDWARDS, W., FORD, A. J., METCALFE, D. J., CROSS, H. B., HARRINGTON, M. G., RICHARDSON, J. E., HILBERT, D. W., LOWE, A. J. & CRAYN, D. M. 2015. Using phylogenetic diversity to identify ancient rain forest refugia and diversification zones in a biodiversity hotspot. Diversity and Distributions, 21, 279-289.
3	COSTION, C., BRANSGROVE, K., SIMPSON, L., SCHULTE, K., ABELL-DAVIS, S., METCALFE, D., ROSSETTO, M., LOWE, A. J., WILLIAMS, & S. AND CRAYN, D. M. 2014. What is at risk? Identifying rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics bioregion. Report to the National Environmental Research Program. Reef and Rainforest Research Centre Limited, Cairns (58pp.).
4	PARKS AUSTRALIA AND LATROBE UNIVERSITY 2015. Christmas Island Yellow Crazy Ant Control Program: Moving from Chemical Control to a Biological Control Future.
5	QUEENSLAND GOVERNMENT 2011. Tropical North Queensland Tourism Opportunity Plan 2010-2020.
6	RESIDE, A. E., BEHER, J., COSGROVE, A. J., EVANS, M. C., SEABROOK, L., SILCOCK, J. L., WENGER, A. S. & MARON, M. 2017a. Ecological consequences of land clearing and policy reform in Queensland. Pacific Conservation Biology.
7	RESIDE, A. E., VANDERWAL, J. & MORAN, C. 2017b. Trade-offs in carbon storage and biodiversity conservation under climate change reveal risk to endemic species. Biological Conservation, 207, 9-16.
8	WTMA 2008. Climate change: impacts and responses. Annual Report and State of the Wet Tropics Report 2007–2008. Wet Tropics Management Authority.
9	WTMA 2010a. Report card assessment of the Wet Tropics of Queensland World Heritage Area – condition and trends. Annual Report and State of the Wet Tropics Report 2008–2009. Wet Tropics Management Authority.
10	WTMA 2010b. Tourism theme report. Annual Report and State of the Wet Tropics Report 2009–2010. Wet Tropics Management Authority.

№	References
11	WTMA 2011. Biosecurity theme report. Annual Report and State of the Wet Tropics Report 2010–2011. WTMA.
12	WTMA 2012. The function of the Wet Tropics of Queensland World Heritage Area in the life of the community. Annual Report and State of the Wet Tropics Report 2011–2012. WTMA.
13	WTMA 2013. State of aquatic habitats, biodiversity and water resources in the Wet Tropics of Queensland. Annual Report and State of the Wet Tropics Report 2012–2013. WTMA.
14	WTMA 2015. Economic value of the Wet Tropics World Heritage Area. Annual Report and State of the Wet Tropics Report 2014–2015. WTMA.
15	WTMA 2016. Ancient, Endemic, Rare and Threatened Vertebrates of the Wet Tropics. Annual Report and State of the Wet Tropics Report 2015–2016. WTMA.