

Freshwater resources

Principle:

The Tiwi Islands are valued for their freshwater resources. Allocation of freshwater quantity and quality should include current and future uses in the areas of domestic supply; recreation, food gathering and tourism; plantation forestry and other economic enterprises; environmental flows and intermittent, short term development use.

Major current uses of the freshwater resources on the Tiwi Islands include domestic supply (including irrigation of small market gardens at Nguiu and Milikapiti), recreation, food gathering and tourism, plantation forestry and the natural environment. Intermittent, short-term demands may also occur during periods of infrastructure development such as road and airstrip construction and upgrades. An assessment by Haig *et al.* in 2003 determined that current usage levels pose no undue concerns to the health and sustainability of the freshwater resources.

Domestic supply

Nguiu, Milikapiti and Wurankuwu each have developed bore fields that supply domestic water. Yimpinari, Taracumbi and Takamprimili outstations are serviced by bores, as are Wulyuwunga, a popular local camping site and Maxwell Creek, the plantation forestry base. A combination of rainwater tanks and a sand spear provides the Port Hurd supply, which is the land base for the sea cage aquaculture development.

Pirlangimpi community and Pickertaramoor camp are each serviced by surface water, while other popular camping sites have water carted to holding tanks during 'bush holidays'. Paru outstation also relies on carted water. It is intended that a proposed outstation at Putjamirra accesses the Wulyuwunga bore for domestic supply.

According to Haig *et al.* (2003), the bore fields at Nguiu, Milikapiti and Wurankuwu have been constructed according to standard methods, which ensure that the possibility of contamination is eliminated or reduced to an insignificant amount. Bores have also been located outside minimum recommended distances from contaminant sources such as rubbish tips, fuel storage and market gardens. While current supplies are adequate, future increases in population may necessitate

upgrading and increased availability. Similarly, bores at Yimpinari, Taracumbi, Takamprimili, Wulyuwunga, Maxwell Creek and Port Hurd are constructed and located to provide an adequate supply with minimal risk of contamination.

The Pirlangimpi domestic water supply from Blue Water Creek is also adequate for current usage, but although treated prior to consumption, is sometimes at risk of contamination from overland flow. A potential borefield has been identified to the east of the community for future development if required.

Haig *et al.* (2003) made estimates of the levels of domestic water use in the three main communities of Nguiu, Milikapiti and Pirlangimpi. Milikapiti and Pirlangimpi estimates are in excess of 1,000 litres/person/day, with Nguiu over 500 litres/person/day. This may indicate that water is not used as efficiently in Milikapiti and Pirlangimpi, however corroborative evidence is unavailable.

Paru outstation does not currently have a suitable or sustainable domestic water supply. In the past, a pumping station supplied water from a creek approximately 4km away, however this was decommissioned due to the creek becoming brackish during the dry season. A pipeline constructed across the Apsley Strait from Nguiu was also unsuccessful due to the strong currents and shifting sea bed, and bores drilled in the vicinity of Paru in 2000 proved unsuitable due to low yields (0.2 litres/second). There are two existing bores 13km away at Three Ways, and advice from the Northern Territory Government is that either could be used as a production bore for Paru outstation.

Recreation, food gathering and tourism

Although Tiwi prefer saltwater fish to freshwater fish as a food resource, wetlands provide habitat for a number of important food species, including water chestnuts (also important magpie goose food), waterlilies, mud mussels, magpie geese, whistling ducks, burdekin ducks, water monitors and freshwater turtles. Pelicans are also a common subject for wood carvings, and paperbark trees were historically used for a variety of



purposes. Moantu Lake on Bathurst Island is an important spiritual site, and people often spend time camping during 'bush holidays' in wetland areas. Coastal swamps adjacent to communities are also important areas for recreation.

Freshwater springs in the region provide high quality waterfalls and swimming areas for both local residents and tourists. Tumwarripi and Taracumbi waterfalls, and Maralumpi and Kilu-Impini waterholes have all been popular destinations for tourists, and the Johnston and Jessie Rivers are also used by fishing tour operators.

Uncontrolled and sustained access has caused degradation of waterway banks in several areas, due to vehicle and foot traffic, semi-permanent camp sites, and informal boat launching. Remedial works to date have been carried out in the worst affected areas of Taracumbi, Tumwarripi and Maralumpi.

Plantation forestry

The potential contaminants of surface and groundwater from plantation forestry establishment and operation include sediments (surface water only), nutrients from fertiliser applications, agricultural chemicals such as herbicides and pesticides, and other chemicals such as fuel and oil.

It is expected that there will be some initial elevation of sediment and nutrient levels in surface runoff, however previous experience from areas under intensive horticulture, and advice from the NT Government suggests that these are likely to return to background levels once plantations mature.

Three tiers of mitigation measures have been developed for the forestry project, including at source, within plantation areas and off-site. Measures include protocols for storing, handling, transporting and applying chemicals; protocols for waste disposal; effective erosion and sediment control; and the provision of protective buffers around receiving waters. A monitoring programme has also been developed that measures and assesses elements relevant to forestry operations.

Information on groundwater levels is available from a number of bores scattered throughout the region. This information is sufficient to track both short and long term trends in groundwater levels and associate them with monthly rainfall.

Monitoring bores have also been established in and near forestry areas. This will allow gross changes occurring at or near plantation sites and not elsewhere to be determined, and possible impacts assessed on advice from the NT Government.

Natural environment

Wet and dry rainforests on the Islands have been identified as significant at the Northern Territory scale, and wetlands and riparian areas as important for conservation values. All of these ecosystems are dependent on ground and surface water for their health and maintenance. Haig *et al.* assessed that current levels of water use has not caused any noticeable impact on areas of environmental significance, however the issue should be addressed when increasing existing or establishing new bore fields.

Intermittent use

Large scale developments can be heavy users of the freshwater resource. Projects during 2003 included upgrading the Pirlangimpi airstrip, a major upgrade of a section of road between Pirlangimpi and Maxwell Creek, and development of port facilities for forest log export. These projects have been assessed as having no significant impact on the long term water resource, and future large scale projects will similarly need to be assessed on a case by case basis.



Outcome:

Sustainable use and allocation of the freshwater resources on the Tiwi Islands.

Objective:

5. Develop and implement processes that balance freshwater flow volumes and flow quality between the maintenance of biological systems, quality of life for residents and consumptive needs.

Recommended Actions:

- 5.1 Develop and implement a groundwater monitoring programme for Nguiu and Milikapiti bore fields.
- 5.2 Designate and exclude from development the potential bore field that has been identified for Pirlangimpi.
- 5.3 Implement contamination protection measures for Blue Water Creek.
- 5.4 Develop and implement an education and awareness programme on domestic water use.
- 5.5 Provide a sustainable water supply for Paru outstation.
- 5.6 Investigate the feasibility of 'Waterwatch' type programmes to monitor surface water quality at local swimming holes.
- 5.7 Develop Codes of Practice for tour operators and recreational users wishing to regularly access waterways and wetlands, and include in licence provisions.
- 5.8 Implement freshwater management and monitoring commitments for the plantation forestry project.
- 5.9 Initiate and manage research on environmental flow, spring flow, and deep aquifer production capability and recharge.
- 5.10 Recommission the NT Government surface water gauging stations at Blue Water Creek, Taracumbi Creek and Takamprimili Creek.
- 5.11 Include assessments of freshwater resource requirements for large scale development projects where relevant.

