

SUMMARY

Aircraft overflights and associated noise in National Parks is an environmental management issue which is becoming increasingly important as growth in the tourism industry occurs in Australia and world-wide. The protection of natural quiet is arguably as crucial as the protection of wildlife and clean water.

As a result of issues identified regarding use of the Whitsunday Islands Area, the Great Barrier Reef Marine Park Authority (GBRMPA) commissioned a social survey of visitors to Whitehaven Beach in the Whitsunday Islands. The survey, undertaken in early 1999, aimed to assess visitor use and experience of the area, while evaluating the influence of aircraft and watercraft on peoples use and amenity (Ormsby and Shafer, 1999). Whitehaven Beach is classified by GBRMPA as a sensitive site but receives a high proportion of the visitors to the Great Barrier Reef Marine Park (the Marine Park, GBRMP), and World Heritage area (GBRWHA). This study aims to complement the social survey providing quantitative information describing actual levels of aircraft activity and noise along Whitehaven Beach, particularly, in relation to the four Recreation Opportunity Spectrum (ROS) settings designated along it. Other anthropogenic sources of noise and activity were also assessed as a function of setting. The main data was collected at sites situated central to each of the ROS settings along Whitehaven Beach. Figure 1.0 details the study site.

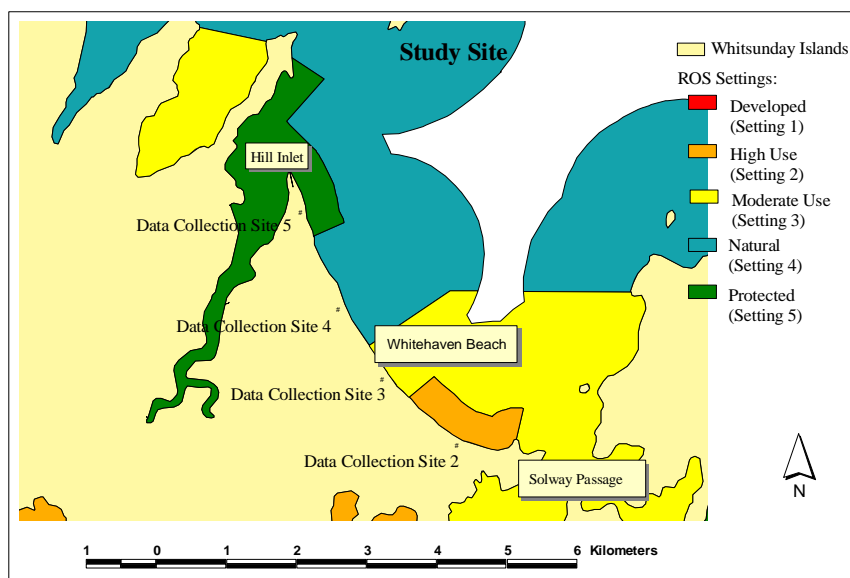


Figure 1.0. Detail of the study site

The key findings of this study are summarised below:

Aircraft Activity -

Overall site 2 experienced the fewest aircraft events followed by sites 5, 4 and 3. The most common aircraft at all sites were seaplanes followed by helicopters. Site 2 received the greatest within site proportion of seaplane events and site 5 the greatest within site proportion of helicopter events. The morning was the busiest time of day peaking between 11:30 and 12:30 with an average of 4.7 - 6.2 flights per hour over all sites. Aircraft were observed between 07:00 and 17:00. Seaplane events were most common in the morning. Other event types did not show a

trend of activity relative to time of day. 71% of all aircraft events at Whitehaven Bay affected 3 or 4 of the sites.

Natural Sound Levels -

Natural sound levels were lower at site 5 than at the other three sites. The overall average natural day-time sound level on the landward side of Whitehaven Beach is calculated to be 57dBA. However, the actual average is thought to be in the range of 50 - 55dBA (based on comparative measurements made with a more sensitive sound meter). These results are consistent with recordings made in the USA and predictions for sites situated close to surf and exposed to wind (Fidell et al. 1990; Bowlby et al. 1990; US Forest Service 1992).

Aircraft Sound Levels -

At sites 3, 4 and 5, 95% of aircraft events registered above background sound levels and at site 2, 85% did so. Maximum decibel levels recorded for aircraft events ranged from 54dBA - 98dBA over all sites. The most commonly recorded maximums at all sites were within the range of 60-64dBA. Site 4 recorded the highest average Lmax (68.8dBA) followed by sites 3, 2 and 5 (59.9dBA).

The noisiest times of day varied between sites. Seaplane takeoffs were the loudest recorded event type followed by helicopter flyovers associated with a landing or takeoff (low flying helicopters). Military jets which reportedly over fly Whitehaven but which were not observed during the course of this study are expected to cause the highest sound readings of all aircraft visiting Whitehaven. A strong negative correlation (significant at $\alpha = 0.01$) was established between increasing distance and increasing sound level for seaplane takeoffs.

Sites 3 and 4 recorded the longest duration of aircraft sound above average background sound levels and sites 2 and 5 recorded the shortest duration. The average duration of aircraft sound levels above background sound levels is calculated to be 57 seconds. The longest recorded duration was 420 seconds.

Other Anthropogenic Influences -

The majority of the people on the beach at 10:30 and 14:00 were in setting 2. Few people were recorded in any setting at 17:00. A similar number of watercraft were recorded passing through each setting. However, the number of watercraft events considered loud enough to warrant recording was much higher at site 2 than at all other sites. The highest recorded watercraft sound level was 79dBA and the longest recorded duration above average background sound level was 820 seconds (both were recorded at site 2). All types of watercraft occurred in all settings and included jet-skis, speed boats and large hydrofoils.

Notably the results of this study represent the lower levels of aircraft noise and activity experienced at Whitehaven Beach over a year.

It is concluded that, in terms of aircraft activity and noise levels along Whitehaven Beach, a trend inconsistent with that predicted by the definitions of the ROS settings is apparent. The high use zone receiving the lowest levels of use and noise exposure and the moderate and natural use zones receiving the highest levels of use and noise. This appears to be related to planning for the area as aircraft landing zones have been established in settings designated to receive minimal aircraft activity while the ROS

settings themselves comprise small spatial areas. However, there also appears to be a problem of compliance with restrictions on access to settings. For example, aircraft takeoffs occurred beyond designated zones as did motorised water sports (such as jet-skis). For the anthropogenic influences of watercraft and people, the high use setting received the most use, consistent with expectations. However, a gradient in human and watercraft use in line with the definitions of the ROS settings was not apparent between the other settings. Aircraft were found to register the highest decibel levels of any sound source on the beach with peaks ranging from 0 - 40dBA above average natural sound levels. Yet, watercraft potentially cause an equivalent or greater noise impact, due to emitting noise for longer durations.

It is recommended that GBRMPA continue working toward comprehensive aircraft management policy development for the Great Barrier Reef Marine Park and that this study be used as partial justification for a more comprehensive baseline and monitoring study of aircraft and watercraft at Whitehaven Bay and in the Whitsunday Islands generally. Any future research should meet Australian Standards for sound measurement and therefore be able to be used for decision making with legal implications.

Prior to undertaking further research, it is recommended that GBRMPA consider:

- Its expectations for the ROS settings throughout the Marine Park in terms of aircraft/watercraft activity and noise.
- Appropriate current and future levels of use at Whitehaven Beach particularly in light of the beach's designation as a sensitive site.
- The possibility of developing dose response curves for the area.
- The need for ROS planning on a larger geographic scale than that at Whitehaven Bay.

As part of future research, it is recommended that GBRMPA further investigate:

- Flight paths and takeoff positions which would result in the most acceptable impact within the ROS settings along Whitehaven Beach and in the Whitsunday Islands generally.
- Potential noise mitigation measures including distance (height) of the sound source from the listener, phasing in the use of quieter aircraft technology and the potential for developing Fly Neighbourly Policies with local operators.