Abstract

The environment is a key resource for Thai tourism, therefore, maintenance of environmental quality is important for sustainable tourism. Threats to coral reefs are increasing globally, and nutrient enrichment of coastal waters and turbidity from sewage discharge and storm runoff are among the main stressors. Runoff and sewage discharge from land developments cause significant changes in water quality of coastal waters, resulting in coral degradation. Numerous sewage outfalls associated with rapid tourism development affect coastal water quality around Phuket, Thailand. Mitigation of threats requires that pollution impacts be quantified when suspected of degrading local reefs.

This research was conducted to clarify the effect of tourism on water quality and biota of coral reef communities. Sewage effluent was used as an indicator of water pollution. The research also sought to establish the extent to which tourist/tourism activities are responsible for the degradation of marine resources.

Manipulative experiments were used to clarify the effect of sewage effluent, in terms of light reduction and nutrient elevation, on coral growth and survival. The experiments revealed that light was the major determinant of coral survival and growth rate, and nutrient enrichment exacerbated any decline in growth and survival.

Water quality and biological monitoring around the Phuket region was also undertaken to quantify water quality and biotic characteristics at various distances from sewage outfalls and different levels of tourist intensity. Questionnaire surveys were used to identify the link between tourism and water and biotic quality.

The research revealed strong gradients in water quality and biotic characteristics associated with tourism concentration levels as well as seasonal variability. Water and reef quality decreased with increasing tourist intensity, but improved with increasing distance from sewage discharge. In addition, the effect of wastewater discharge was not localised around the source of pollution, but appeared to be transported to non-developed sites by currents, especially in the wet season.

For tourism, satisfaction with the natural environment correlated with biological and water quality, but was negatively correlated with tourist intensity. Should there be a perceived decline in the quality of reefs, international tourists indicated they would change their holiday destination preference, while Thai tourists indicated an interest in contributing to resource restoration through involvement in conservation projects. The implication is that the sustainability of Thai marine based tourism is vulnerable if tourist satisfaction is negatively impacted by a decline in the quality of the coral reefs. Given Thailand’s economic dependence on international tourism, its dependency on the quality of marine experiences, and declining water and reef quality, efforts to abate existing anthropogenic threats to reefs must be a priority.

Key words: sewage, runoff, anthropogenic pollution, coral, fish, macroalgae, Thailand