JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/Conference Title: Operation Wallacea Marine Conservation Expedition. Indonesia 2005. Craig Menzies s0233687@sms.ed.ac.uk .....

Travel Dates: 16th June – 27th July 2005 .....

Location: Hoga Island , Marine research centre. Sulawesi, Indonesia .....

Group Member(s): Volunteer/ students from across UK universities (+ international students) .....

Aims: Broad range of research aims, will general goal of increasing marine science of coral reefs, fish communities and surrounding marine environments. Development of sustainable ecological/community programmes .....

OUTCOME (not less than 300 words):-

Operation Wallacea. Marine research expedition (2005), Sulawesi, Indonesia.

Craig Menzies (University of Edinburgh. S0233687@sms.ed.ac.uk)

Expedition/project name: Operation Wallacea marine research.
Travel dates: 15th July – 28th August 2005.
Project Location: Hoga Island, Sulawesi, Indonesia. Research site shown in Figure 1.

Figure 1. Map of South-eastern area of Sulawesi. Sulawesi is itself in the south-eastern corner of the Indonesian archipelago. The red box indicates the marine area where Operation Wallacea's marine research is concentrated, itself within the Wakatobi Marine National Park which was created as a result of Operation Wallacea's past research.

Aims: An assessment of the health status of coral reef ecosystems in the area.

Operation Wallacea is a UK-based scientific research organisation, which has been running expeditions in Sulawesi, Indonesia, for the past eight years. The organisation runs continuous marine-monitoring programmes that aim to better understand the health, resilience of, and changes in marine ecosystems. The expeditions offer students the opportunity to complete their dissertation or private studies, as well as offering positions for 'general volunteers', whom take part in the fieldwork components of marine research. Operation Wallacea also carries out annual research into sustainable development and other sociological subjects. Its research aims to account for, and to better understand the attitudes, concerns, and desires of local Indonesians resident in the island area. Operation Wallacea recognises that understanding the interaction between the environment and local people is of great importance, and aims to incorporate those understandings into its policies whether related to fish communities or fishing quotas.

The research that I, as a general volunteer, was involved with included making a visual assessment of the present health status of coral cover at a number of reef locations in the vicinity of Hoga island, - the expedition's permanent research centre and laboratory. The information recorded from the reef assessments has been used in an on-going study (led by Dr Mike Flavell) which is aiming to make an annual assessment of the same coral reef communities for a fifteen-year period. This study is aiming to draw conclusions on the changes occurring within reef communities, detailing information such as the nature of, direction and scale of fluctuations in health. The project should yield better understandings of how coral reefs 'behave'.

In the first week of the fieldwork each general volunteer was required to take and pass the assessment of an 'Indo- Pacific coral reef ecology' course administered by Operation Wallacea. This course gave the training required for accurately identifying coral reef types (to a level that is suitable for research).
Eight geographically-separate coral reef locations were examined over the 6-week study period. At each location, 3 sub-sites were designated by manually securing permanent markers onto the rock/coral surface. Each sub-site was marked-out as a 2m x 10m rectangular area. Within each area, all coral types present were recorded and an assessment made of their health (by determining the percentage of coral area that was diseased or dead). Corals can indicate the presence of a disease in a number of ways, but most often, the indication of poor health is shown by the 'bleaching effect' – where the coral itself shows a white colour, indicating the loss of a symbiotic partner in the coral's physical structure.

The data taken from the sites examined was fed into a database. The same database will be used over a ten-year time period to record information taken from the same sample strategy, at the exact same locations. After the completion of this, a number of conclusions will be made regarding the direction that the coral reef ecosystems examined are heading in, in terms of the percentage change in corals dead or diseased, or whether certain coral types are more susceptible to change than others. The study will also aim to make an analysis of the temporal and spatial scales on which changes in reef communities occur.

Results:
The data obtained from the reef monitoring programme, as explained earlier, will be used in a long-term monitoring programme which will yield the main bulk of its analysis and results in the future, but some general conclusions can be made at this stage. Some of the results at this stage are inferred from considerations of the health of reefs at Operation Wallacea sites in Honduras and Egypt.
There was a decline in the spiny lobster, Diadema, butterfly fish and grouper populations. Living coral coverage has declined by roughly 10% globally; the reefs exposed to high sewage concentrations were found to contain higher than normal algae coverage.

Roughly half of fish populations surveyed inside Marine Protected areas, show greater success/ abundance (and recovery) than those species populations outside the protected area. The same trend is observed for invertebrate species, although the extent of the success is considerably less pronounced, at one in ten species showing such improvements.

The fieldwork component of this research study was ideal in a number of respects. Firstly, it offers the chance for research to be carried out by scientists for whom this is the first marine research undertaken. The research does not require a high level of diving ability (PADI Open Water is adequate). The research methodology is easy to understand and implement, even for those individuals with no previous marine/ diving research experience. Volunteers benefit from the experience of professional scientists in the field of marine/ coral research, gaining skills and insights from them. Ultimately, a lot of the responsibility of the project can be taken off the general volunteer, as the individual leading the project is totally responsible for ensuring the project's completion.

This approach to research does suffer from the fact that the level of identification of coral types is such that the insights into coral reef change are slightly more restricted than they would have been had each coral been identified at a species level. However, this consideration is somewhat academic due to the huge number of coral species and the subsequent many years of training required in order to identify them all.