Guidelines for Managing Coral Reefs

The table below is adapted from a new publication entitled "Environmental guidelines for development in the Lesser Antilles" published by the Eastern Caribbean Natural Area Management Programme. It is a handbook for Caribbean environmental planners and decision-makers, focusing on critical resources and habitats, such as mangroves, coral reefs, fisheries and sociocultural resources. Tables, such as the one presented here, are given to show critical activities, problems arising and solutions.

The critical activities, their effects and most of the management guidelines presented appear to be broadly useful for tropical islands. This handbook is a useful tool or at least a good model for planners and decisionmakers in many developing countries to adapt to their particular situations.

Copies of the 44-page handbook are available for $8.50, including airmail, from: Eastern Caribbean Natural Area Management Programme, West Indies Lab., Teague Bay, Christiansted, St. Croix, U.S. Virgin Islands 00820. •

Critical activities	Problems derived from activity	Guidelines for management
DIRECT		
1. Dredging (for harbours, sand, swimming areas, etc.)	– Structural damage to or destruction of reefs in damaged areas. Indirect: Lowered productivity, sedimentation, and turbidity when reefs are downstream of dredged areas. Heavy sedimentation can smother delicate reef organisms.	– Inshore ocean dredging should be considered a last resort and only after careful planning; currents and substrate should be investigated, as well as various dredging techniques—economics should not be the major consideration. – A competent authority should supervise and monitor dredging and aftereffects; liability for damage should rest with the permittee.
2. Fishing, both commercial and recreational	– Overfishing can result in species population decline. – Pot fishing can cause structural damage when pots are dropped on corals. – Spear fishing can cause depletion of selected species endemic to reef environments, and be dangerous to swimmers. – Poisoning of fish can cause widespread mortality of species other than targeted fish.	– Develop catch reporting system; set limits on harvests; minimum size limits on depleted species; protect nursery areas; provide adequate enforcement of regulations. – Set and enforce mesh size limits to protect juvenile and small fish; investigate use of self-destruct windows for fish pots. – Protect areas where spear fishing is causing depletion. – Prohibit use of poisons for fishing.
3. Removal of corals for aggregate, souvenirs, jewelry, etc.	– Structural damage to reef, especially from mining coral for aggregate. – Decline in population and diversity from removal of live corals.	– Regulate the removal of corals through limits, sale restrictions, etc. – Prohibit the taking of live corals for any purpose other than bona fide research.
4. Bombing, blasting, dynamiting	– Structural damage, sometimes resulting in destruction of entire communities. – Secondary systematic damage to ecosystem through interference with food web.	– Prohibit the use of explosives in or near living reef systems.
5. Boating	– Structural damage from anchors.	– Place permanent moorings and prohibit anchoring in reef areas that are popular anchorages.
6. Intensive recreational use	– Structural damage from human bodies: standing, kicking, grabbing, etc. – Lowering of species diversity, as shy species seek new habitats.	– Protect the most critical reef ecosystems with special status, such as marine park, and provide for supervision and law enforcement.
INDIRECT		
7. Earthmoving, excavation, and agriculture and industry that result in run-off and erosion.	– Increased turbidity, lowering productivity. – Mortality to reef associated species from pesticide run-off.	– Classify land areas with respect to soil and drainage data; implement permit and review system for all proposed earthmoving; schedule activities in dry season if possible; do not remove vegetation surrounding site; standards for restoration should be set.
8. Release of industrial effluents into reef areas	– Oil, thermal, or chemical pollution, resulting in species mortality and habitat degradation.	– Make provisions for safe and proper storage of toxic wastes and prohibit their disposal in nearshore waters.
9. Release of sewage	– Turbidity, lowering productivity. – Increase in algal growth, resulting in smothering of corals.	– Locate sewage outfall pipes well beyond nearshore habitats and away from reef systems.