

Section 9. DEFINITIONS

(The following definitions are defined in the context of coral bleaching and fish spawning aggregations.)

CORAL BLEACHING DEFINITIONS

Accreditation = To sanction or authorize.

Accretion = Growth by external addition of new matter

Agricultural Run-off = The drainage of water from agricultural land

Bathymetry = Measurement of the depth of the sea floor below sea level

Biodiversity = The number of different species present in a given environment (species diversity). Or, the number of different ecosystems present in a given environment (ecological diversity)

Bioerosion = Erosion caused by living organisms

Biota = Living organisms

Coral Bleaching = The process by which the symbiotic algae in a coral leaves its host, resulting in a loss of color.

Calcium Carbonate = The mineral laid down by a coral to create the hard structure surrounding the organism

Colloids = Substances consisting of very tiny particles that are suspended in a continuous medium, such as a liquid, a solid, or a gaseous substance

Colored Dissolved Organic Matter (CDOM) = The solution of plant and animal matter in water

Connectivity = Natural linkages among reefs including ocean currents, larval dispersal, spawning patterns, and movements of adult fishes. Connectivity is an important part of dispersal and aids in the replenishment of biodiversity on reefs damaged by natural or human-related agents

Contiguous = Touching/adjacent

Contiguous Habitats = Habitats that share a boundary

Cooling = Local oceanographic conditions such as vertical mixing of heated surface waters with cooler deeper waters that can reduce temperature stress

Coral Recruit = Settlement of a coral larvae to a permanent location

Deforestation = The act of cutting down trees within a given forested habitat

Desiccation = To dry out

Distant Linked Habitats = Non contiguous habitats linked by connectivity

Ecotourism = Responsible travel to natural areas that conserves the environment and sustains the well-being of local people. (The International Ecotourism Society)

Eddy = A current, as of water or air, moving contrary to the direction of the main current, especially in a circular motion

Functionally linked habitats = Connected environments that are intended to conserve "all" biodiversity in an area- typically large and usually include both aquatic and terrestrial targets

Genetic Diversity = Genetic variation within a species

Local Extinction = The complete loss of an organism in a specific part of its range

Marine Protected Area = Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment (IUCN definition)

Mortality = The rate at which a particular species or population dies

Phoenix Coral = Regeneration of a coral colony from live deep tissues

Pigment = A compound that gives color to tissue

Pond-Effect = Wide temperature fluctuations in back-reef lagoons, especially shallow lagoons behind fringing reefs

Promontory = A high ridge of land or rock jutting out into a body of water

Refugia = 1. An area that has escaped ecological changes occurring elsewhere and so provides a suitable habitat for relict species. 2. An area of relatively unaltered climate that is inhabited by plants and animals during a period of continental climatic change (e.g., glaciation) and remains as a center of relict forms from which a new dispersion and speciation may take place after climatic readjustment. 3. *Secure areas that are protected by natural factors and human intervention from a variety of stresses. They function as reliable sources of seed.*

Relief (High or Low, Mapped) = The differences between elevation and slope of higher and lower parts of a given surface

Replication = The process by which multiple samples of any habitat types are secured in a network of protected areas. Replication helps to spread the risk of any large-scale event destroying all protected examples of any habitat type

Representation = The inclusion of a full range of habitat types into a protected area system. Representation of all habitat types helps to ensure that the full complement of species for that habitat type is protected

Resilience = The ability to recover quickly from stress and/or change

Resistance = The capacity of an organism or a tissue to withstand the effects of a harmful environmental agent. Resistant reefs play a critical role in reef survival by providing one reliable source of larvae to recruit to and enable recovery of affected areas

Salinity = Measure of salt per unit of water usually measured in parts per thousand (seawater is generally around 35 parts per thousand)

Screening = Screening by suspended or dissolved matter reduces sunlight penetration and may reduce bleaching

Sediment = Soil or particulate organic and inorganic matter carried in the water

Sedimentation = The settling of particulate matter

Shading = Reduced exposure to the harmful effects of sunlight.

Site Conservation Planning = planning methodology which places sites in their larger ecological context; setting conservation priorities and strategies to conserve both single and multiple conservation areas, taking direct conservation action; and measuring conservation success

Species Diversity = The number of different species present in a given environment

Stakeholder = Any person with a vested interest in a reef ecosystem

Stress Tolerance = The response of organisms to stressful conditions that have been repeatedly exposed to a stress, such as an exposed reef flat exposed to warm waters, that may result in a natural tolerance against bleaching

Susceptible (Susceptibility) = Easily influenced or affected

Symbiotic Algae/Zooxanthellae = Zooxanthellae are tiny symbiotic algae that provide food and oxygen to the coral, allowing their host to direct more energy toward constructing its calcium carbonate skeleton. Bleached corals lose their zooxanthellae and turn white. In extreme cases of bleaching, corals die

Tolerance (Thermal, Stress) = The ability to survive and grow in the presence of normally toxic conditions (i.e. Heat)

Topographical = the characteristics describing the physical features of the environment

Turbid = Limited visibility due to particulate matter suspended in the water; murky

Upwelling = movement toward the surface of deeper waters

FISH SPAWNING AGGREGATIONS DEFINITIONS

Adaptive Management = The process of changing a management strategy in response to measuring its success

Aggregation = An increase in fish densities to at least three times the “normal” density on the site

Apex Predator = A predator at the top of the food chain, upon which no other organism preys

Belt Transect = A unit of data collection using transect lines of a fixed width

Buffer Zone = The region near the border of a protected area; a transition zone between areas managed for different objectives (European Environment Agency)

Cannula/Cannulation = A metal tube used to insert into a body to draw off liquid or introduce medication

Cascading Impacts = When one direct impact has an effect on something seemingly unrelated (e.g., Taking out all the herbivorous fishes from an area (direct effect) leaves the algae to grow unchecked and take over the reef leaving it uninhabitable for corals (indirect effect))

Catchment = An area that catches water

Circle Hook = Fishing hook where the hook tip is at a 90 degree angle from the shaft which minimizes hooking fish in the throat or gut

Connectivity = Natural linkages among reefs including ocean currents, larval dispersal, spawning patterns, and movements of adult fishes. Connectivity is an important part of dispersal and the replenishment of biodiversity on reefs damaged by natural or human-related agents

CPUE = Catch Per Unit Effort, the number of fish caught per unit time/effort

Current Drogue = An apparatus used to measure the speed of currents

Destructive Fishing = Using cyanide, dynamite, or other methods that cause coral breakage to kill all reef life (including corals, other invertebrates, as well as unmarketable species) for short-term profits

Extractive (Non-Extractive) = Taking something out of an environment versus leaving it in place. For example, food fishing is extractive, but catch and release fishing, snorkeling and diving, which leave the fishes in the environment, are non-extractive.

Fecund (Fecundity) = Natural level of fertility (e.g. Most adult animals are sufficiently fecund to replace themselves many times over)

Fishery-Dependent = Sources or methods that are described with the use of fisheries statistics or information

Fishery-Independent = Sources or methods that are described without the use of fisheries statistics or information

Fork Length = The measurement between the tip of the nose of a fish to the mid-point of its tail

FSA = Fish Spawning Aggregation: An aggregation of fishes for the purpose of reproduction that has a relatively high level of predictability in space and time

Gamete = A reproductive cell (e.g. spermatozoa and ova)

Geomorphology = The study of the characteristics, origins and development of land-forms

Gonadosomatic Index = The ratio of gonad to body weight

Gonopore = The opening through which sperm and/or eggs are released

GPS = Global Positioning System; An electronic unit that receives satellite signals that tells your specific position in latitude and longitude

Gravid = Female animals carrying young or eggs

GSA = Grouper Spawning Aggregation

Hermaphroditic = Containing both male and female reproductive organs

Histological Examination = A study of the structure and chemical composition of an organism's tissues as related to their function

Hydrophone = Underwater microphone

Integrated Coastal Management = A continuous and dynamic process by which decisions are taken for the sustainable use, development, and protection of coastal and marine areas and resources (NOAA)

J Hook = Fishing hook shaped like the letter "J" where the hook tip is parallel to the hook shaft

LRFFT = Live Reef Food Fish Trade; an international trade in live reef food fish with demand centers largely in Asia and source countries for preferred reef fishes in SE Asia, the western Pacific and parts of the Indian Ocean

Macroscopic = Large scale

Milt = Sperm and associated secretions

Morphometric Measurements = The measurements taken of an animal pertaining to its outer structure and form (e.g., Length, width, fork length, weight)

Marine Protected Area = Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment (IUCN definition)

Multispecies FSA = A Fish Spawning Aggregation containing multiple species spawning in the same area over time

NGO = Non-Governmental Organization

Oocyte = An egg at a stage before maturation

Otolith = A calcareous structure found in the inner ear of fish and involved in orientation and hearing. In some species, distinctive growth lines can provide information on fish age because the otolith grows in proportions to body growth

Photomosaic = Mosaic of photographs aligned with one another to illustrate a larger area

Predictive Power = The ability to foresee conditions based on existing information

Protogyny = In a colonial or hermaphroditic organism, having the female gonads or individuals mature before the male ones

Resident Aggregations = May form frequently, often over an extended period and occur close to, or even within, the areas of residence of participating fish

Ripe/Running = Gonad condition when eggs are hydrated (occurring within 12 hours of spawning and often visible by distended belly and/or leaking gametes)

Spent = Gonad condition after spawning- flattened and flaccid- most gametes already expelled

Selective Removal = Targeting a specific size, age, or type of fish to remove from the population

Sink Area = The area to which eggs and larvae disperse and settle

Site Fidelity = Returning to the same area over time

Source of Seed = The area from which fertilized eggs and larvae are exported in sufficient quantity to maintain the local population and to supplement populations down current (e.g., spawning aggregation)

Spur and Groove = The series of gullies divided by higher spurs that cross reefs at right angles below the reef crest

Sticky Water = The net flow through a matrix of reefs (an archipelago on a continental shelf) depends on the net current oceanic current in the far-field and also on the tides. In areas with large tides (> 2m), there is usually a cycle of spring and neap tides. At neap tides, the net offshore current drives a current through the archipelago/reef matrix. At spring tides, the net current is deflected around the reef matrix/archipelago and circulates water around it and not through it. The reef matrix is then little flushed. This sticky water phenomenon is counter-intuitive and was verified from field observations. Sticky water would not apply in an archipelago in the deep ocean or in area with micro-tides

Stratified Sampling Protocol = Multiple transects for sampling a large site at different depths to avoid double counting or missing fishes

Transect = Typically a straight line across an area, along which ecological measurements are taken

Transient Aggregations = Characterized by individuals that migrate over long distances and over a short reproductive season

UTM (Coordinates) = Universal Transverse Mercator (UTM), coordinates measure in meters east and north from two perpendicular reference baselines

Waypoint = A point of latitude and longitude given when using a GPS unit to map an area

Winding = Process of piercing fishes swim bladder for depressurization