

Reef Passages: watery gateways of life between lagoons and the ocean

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[Version specific to Fiji forthcoming]



Reef passages are essential 'communication zones' that underpin both environmental integrity and social resilience in and for island regions. Their protection and sustainable management - grounded in scientific research, local knowledge, and inclusive policy - is fundamental to the future health of reefs.

WHAT ARE REEF PASSAGES?

Reef passages are natural channels or openings in coral reefs connecting sheltered coastal waters and lagoons to the open ocean. These passages may cut through reefs close to the shore or further offshore, and be surrounded by waters of varying depths. Their size (width and length), shape, and physical characteristics can vary significantly—from narrow, winding channels to wide, deep openings.

WHERE DO REEF PASSAGES EXIST?

Reef passages are found throughout tropical and subtropical coral reef systems, especially around island archipelagos in the Pacific, Indian, and Caribbean Oceans. They are particularly prominent in the South Pacific, or in atoll nations like the Maldives. An island can have many reef passages (e.g., 100) or none. They are influenced by physical factors such as tides, currents, and/or river outflows. Satellite and field studies suggest that smaller islands tend to have a higher density of reef passages per kilometer of coastline, enhancing their ecological connectivity. Both local communities and researchers recognize the importance of reef passages for the islands.



Examples of reef passages: I) Kadavu (Fiji); II) Toau (French Polynesia); III) Mayotte, and IV) Grande Terre (New Caledonia)

SOCIO-CULTURAL IMPORTANCE OF REEF PASSAGES

Community Identity and Heritage: Reef passages are sites of local ecological knowledge, marine namegiving and place-making/attachment, and may anchor ancestral myths, storytelling, and customary management practices.

Cultural and Spiritual Roles: For many Islanders, passages are therefore more than physical features - they are 'communication zones' where land and sea, life and afterlife, people, species and spirits intersect. Beliefs exist that spirits of the deceased travel out to sea via reef passages, often accompanied by culturally significant species.

Fishing and Food Security: They are prime fishing grounds for local (incl. commercial) fishers, providing high-value species close to shore and supporting livelihoods and nutrition.

Navigation, Transport & Tourism: These natural gateways are used for boat travel (where waters are too shallow for boats to go above the reef), linking island communities with the open sea for trade, transport, and communication. Hence, they are also important for local tourism economies.

ECOLOGICAL SIGNIFICANCE OF REEF PASSAGES

Biodiversity Hotspots: Reef passages are gathering points for a wide variety of marine organisms. They serve as migration routes for fishes, turtles, sharks, rays, and other species moving between habitats for feeding, breeding, and spawning.

Spawning and Nursery Grounds: Many fish species form large spawning aggregations in or near reef passages, making these sites critical for sustaining healthy fish populations and reefs. This also makes them keystone places for predator-prey dynamics. Large predators, such as sharks and groupers, often congregate at passages to feed on spawning fish.

Nutrient Exchange: Passages allow water, plankton, nutrients, and larvae to flow between ocean and inshore habitats, supporting productivity in lagoons, reefs, seagrass beds and mangrove areas while 'flushing out' pollutants or excess sediments.

WHY CARE ABOUT REEF PASSAGES?

They are **vulnerable and threatened** by:

- Overexploitation (intensive or destructive fishing, especially targeting aggregations),
- Heavy traffic/transport,
- Habitat degradation (via sediment runoff, pollution, and coastal development; alterations to passages can disrupt water circulation and fish movements),
- Lack of management (e.g., overlooked in marine protected area planning),
- Climate change (rising sea temperatures, ocean acidification, increased frequency of extreme weather events).

They can be **managed, protected and sustainably used**, contributing to:

- Well-being of resilient communities who recognize the importance of these spaces, thereby ensuring locally relevant and culturally inclusive conservation strategies.
- Ecosystem health by protecting critical life stages of reef-associated species (and maintain fisheries).
- Conserving areas of special importance for biodiversity and human welfare (thereby contributing to global goals such as the UN Sustainable Development Goal 14 (Life Below Water)).

CHOOSING THE FUTURE OF REEF PASSAGES?

Under a positive scenario, reef passages become well-recognized, protected, and sustainably managed social-ecological keystone places, enhancing both marine biodiversity and the well-being of coastal communities.

Under a 'business-as-usual' scenario, they could be overlooked or degraded, facing overexploitation, pollution, and loss of biodiversity, undermining ecological connectivity and cultural ties.

The reality may be somewhere in the middle, yet great benefits can be supported by:

- Meaningful integration of multiple ways of knowing, participatory science, and socio-cultural respect.
- Explicit/legal acknowledgment and protection of reef passages in planning and management.
- Cooperation and coordination across community, national, regional scales, as well as knowledge systems, disciplines, and policy-makers.
- Science-society-policy dialogues, which will support flexible, reflexive, and context-sensitive approaches to enhance adaptive management.

The future(s) of reef passages thus hinges on whether the ecological, economic, and cultural value of reef passages will be recognized and acted upon, thereby helping to avoid harmful cascading consequences for both ocean and human health.



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