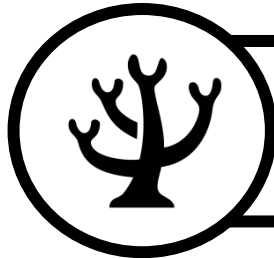# 2018 ANNUAL REEF REPORT

Angsana Velavaru, Dhaalu Atoll, Maldives

Authors: Nicholas Hardman, Hassan Nishan, Steph Skermer, Samantha Gallimore, Steve Newman
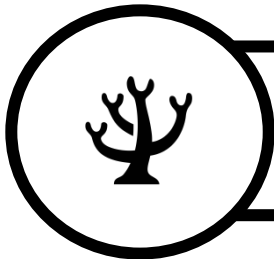
BANYAN TREE
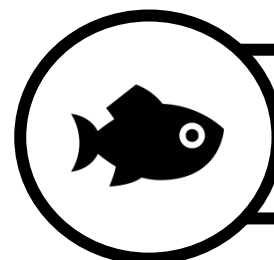GLOBAL FOUNDATION

FINDINGS AT A GLANCE 2018

The majority of sites surveyed in the atoll displayed an increase in coral cover, suggesting recovery from the bleaching event.

Bare rock and rubble have declined while coral cover has increased across all depths.

All sites apart from Lhohi and Velavaru had low recruit density per metre squared.

Biomass of fish families Butterflyfish, Parrotfish and Groupers declined at the majority of sites from 2016 to 2018.

REEF MONITORING

What? Long term data is required to understand natural and human induced change in ecosystems, including impact, recovery and resilience assessments needed for effective conservation.

Implemented in 2016, the Banyan Tree Long Term Monitoring Program (BTLMP) collects baseline data from coral reefs using robust methods based on ReefCheck [detailed methods on the BTGF website].

Why? Establishing baselines and understanding long-term change:

- Understand the **state** of reefs
- Identify **changes** in reef composition
- Identify **coral bleaching patterns**
- Monitor progress on **reef recovery**
- **Support targeted reef restoration efforts**
- Identify **changes** in abundance and biomass of **important fish groups**

2016 Global Bleaching Event

This was the **longest global coral bleaching event** in history since the 1980s. Corals in every major reef region were bleached – dead. One quarter of the Great Barrier Reef was declared dead.

REEF CONDITION
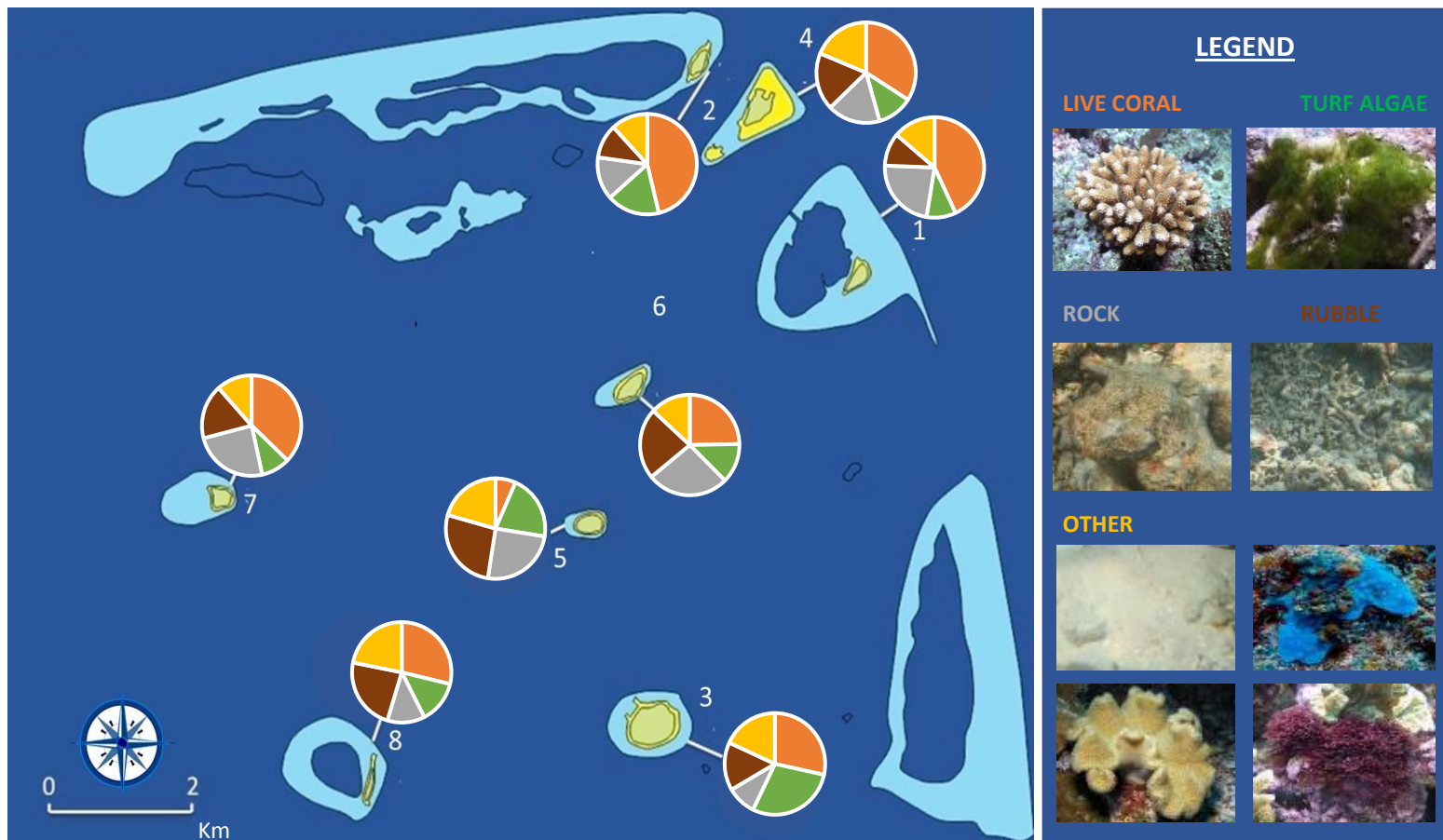
Benthic categories from 8 sights surveyed in Dhaalu Atoll; 1 Velavaru, 2 Vilu Reef, 3 Bandidhoo, 4, Meedhoo, 5 Lhohi, 6 Udhoo, 7 Fandhoo and 8 Potato.

Over the 8 sites surveyed in the Dhaalu atoll live coral and other were the most dominant benthic categories (35.7% and 35.6% respectively). Typically, all reefs surveyed excluding Lhohi had high coral cover, reef 5 located within the atoll had the lowest coral cover (5.7%) while reef 2 located on the outskirts of the atoll had the highest coral cover (44.4%). The majority of the reefs had a higher percentage of bare rock and rubble than turf algae cover indicating substantial grazing from herbivorous fish and invertebrates.
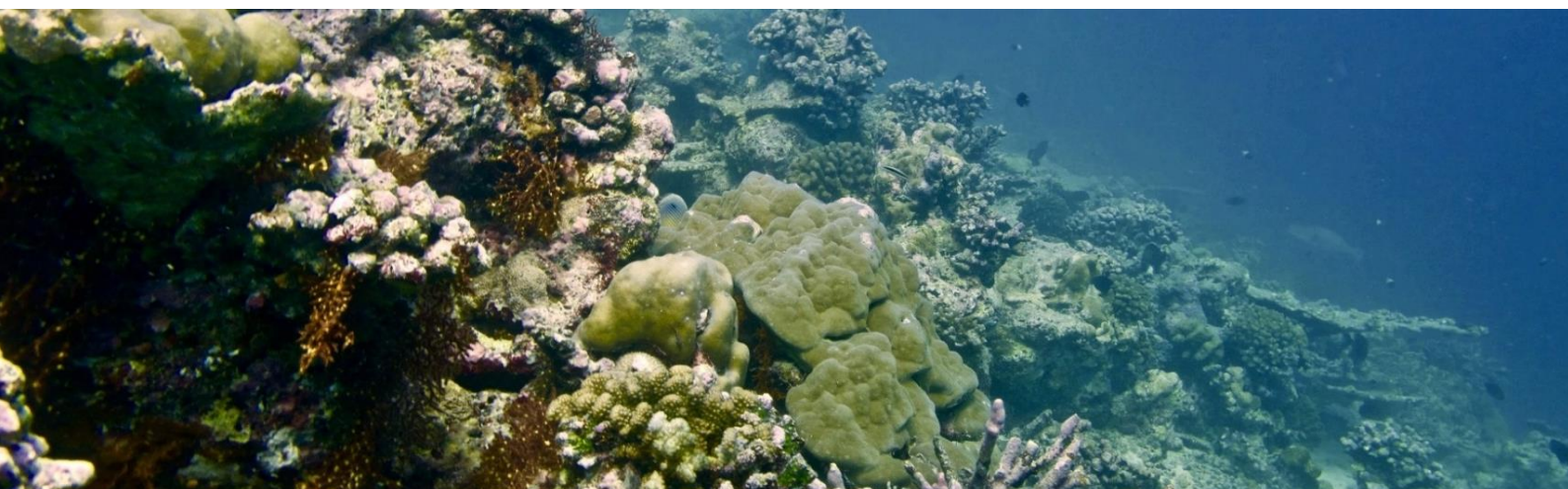
CHANGE IN CORAL COVER
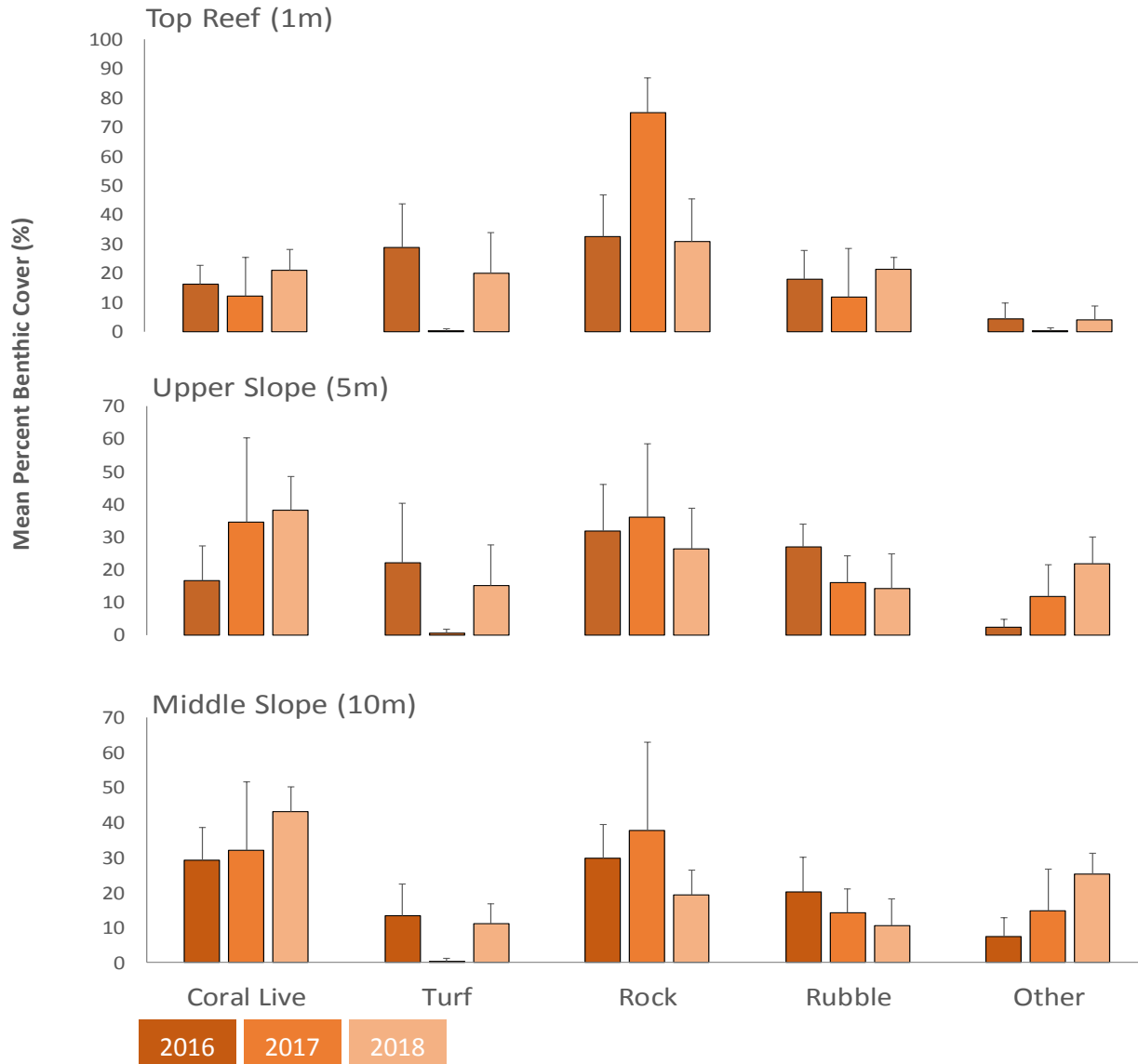

	2016	2017	2018
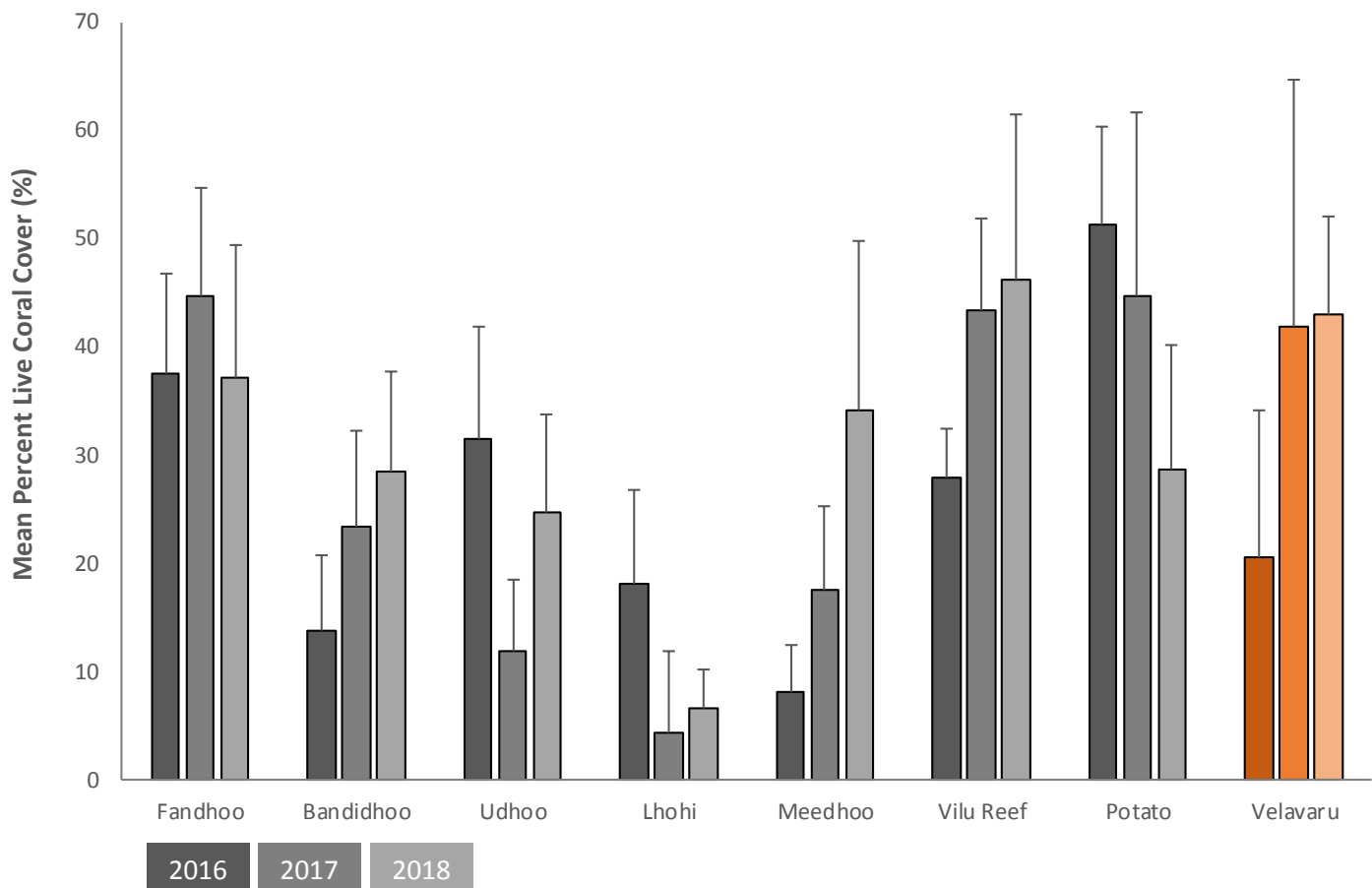
Half of the reefs in Dhaalu Atoll are recovering from the bleaching event in 2016, evidenced by an increase in live coral cover from 2016 (post bleaching) to 2018 at 5m depth across 8 sites within the atoll. After a decline in 2017, Udhoo had the largest increase of coral cover (+107%). Both of the islands inhabited by local communities (Bandidhoo and Meedhoo), increased in coral cover over the three year period (+106.81%, +319.23% respectively).

Potato Island's reef decreased in coral cover (-43.9%) from 2016 to 2018. In 2016 coral cover was the highest in the atoll (+51.25%) however recent development with extensive sand pumping may have caused a decline in coral cover.

HOUSE REEF STATUS

Mean Percent Benthic Cover (%)

Top Reef (1m)

Upper Slope (5m)

Middle Slope (10m)

Coral Live   Turf   Rock   Rubble   Other

2016   2017   2018

At all three depths coral cover increased (+22%, +56%, +33% respectively) from post bleaching to 2018. Coral cover at depths 5m, 10m were high and 1m relatively low in comparison. Middle and upper slope will in theory attract more corals recruits and help improve live coral cover over time.

In 2016 and 2017 rock dominated at all three depths, but in 2018 live coral dominated at 5m and 10m, suggesting the reef is recovering.

Due to a different mythological approaches, turf algae and bare rock have unique results for 2017. However, these categories sill provide colonisable space for coral recruits.

CORAL RECRUITMENT
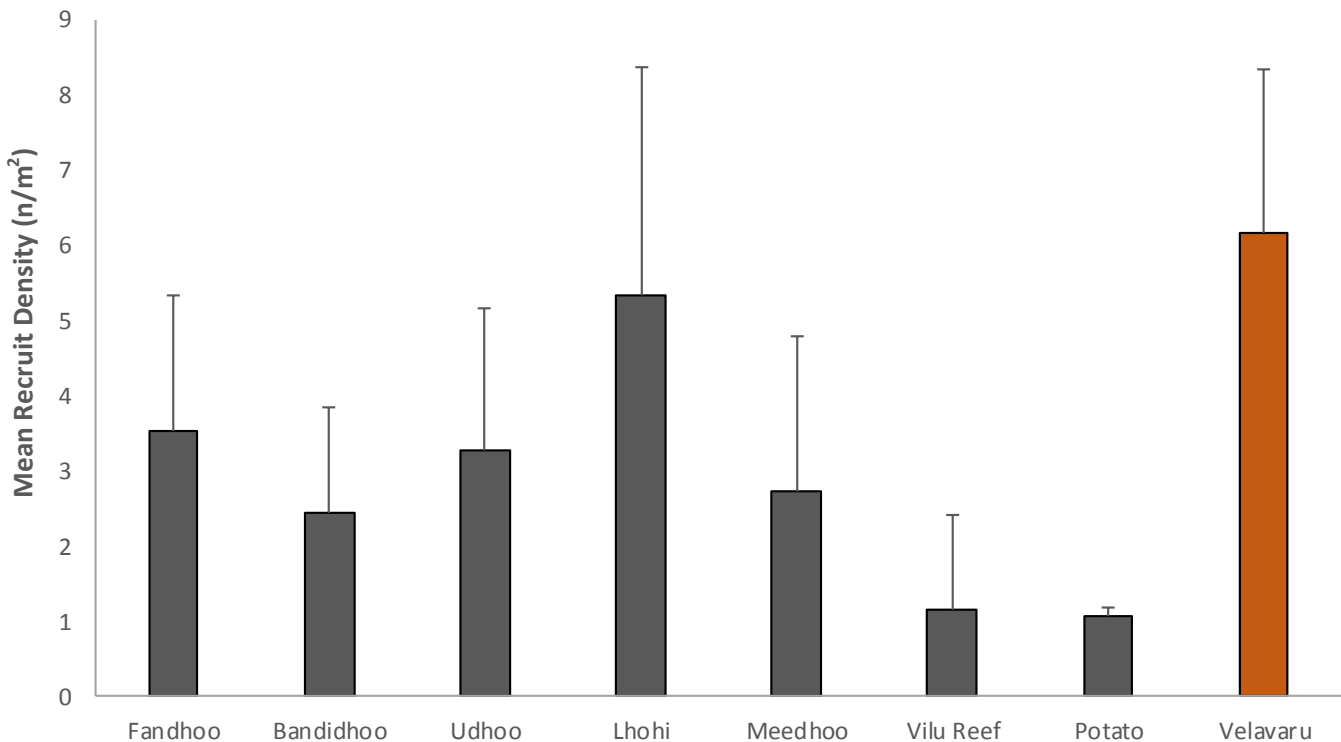
2018

Recruit density is referred to as the number of recruits found per metre squared. Velavaru had the highest density of recruits and Potato had the lowest number of recruits per metre squared due to anthropogenic activities occurring on the island. Lhohi displayed the lowest percentage of coral cover but had the second highest number of recruits, however mainly dominated by *Proties rus*, a fast-growing species of coral.

FISH COMMUNITIES
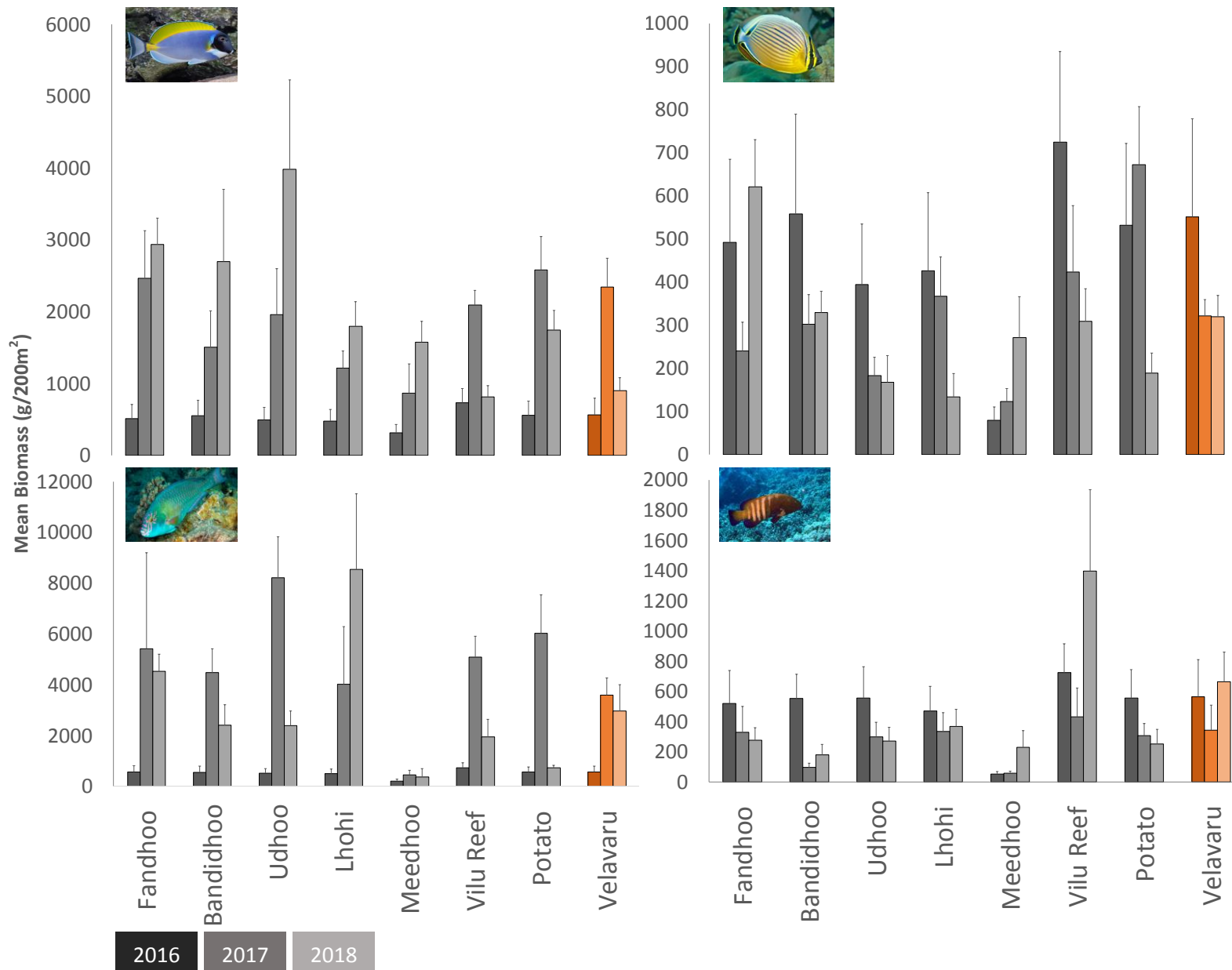
Generally, butterflyfish, parrotfish and grouper biomass declined.

Surgeonfish biomass increased at 5 sites, but decreased at Villa Reef, Potato and Velavaru from 2017 to 2018. This could be an indicator of improved coral cover and a reduction in food availability (turf algae).

Biomass of butterflyfish across the majority of sites declined, contradicting benthic data which displays increased food availability (coral).

Grouper biomass declined at all sites excluding Lhohi, suggestive of an increase in overexploitation of the species due to local fishing pressure.

HOUSE REEF

Mean Biomass (g/200m²)

2016   2017   2018
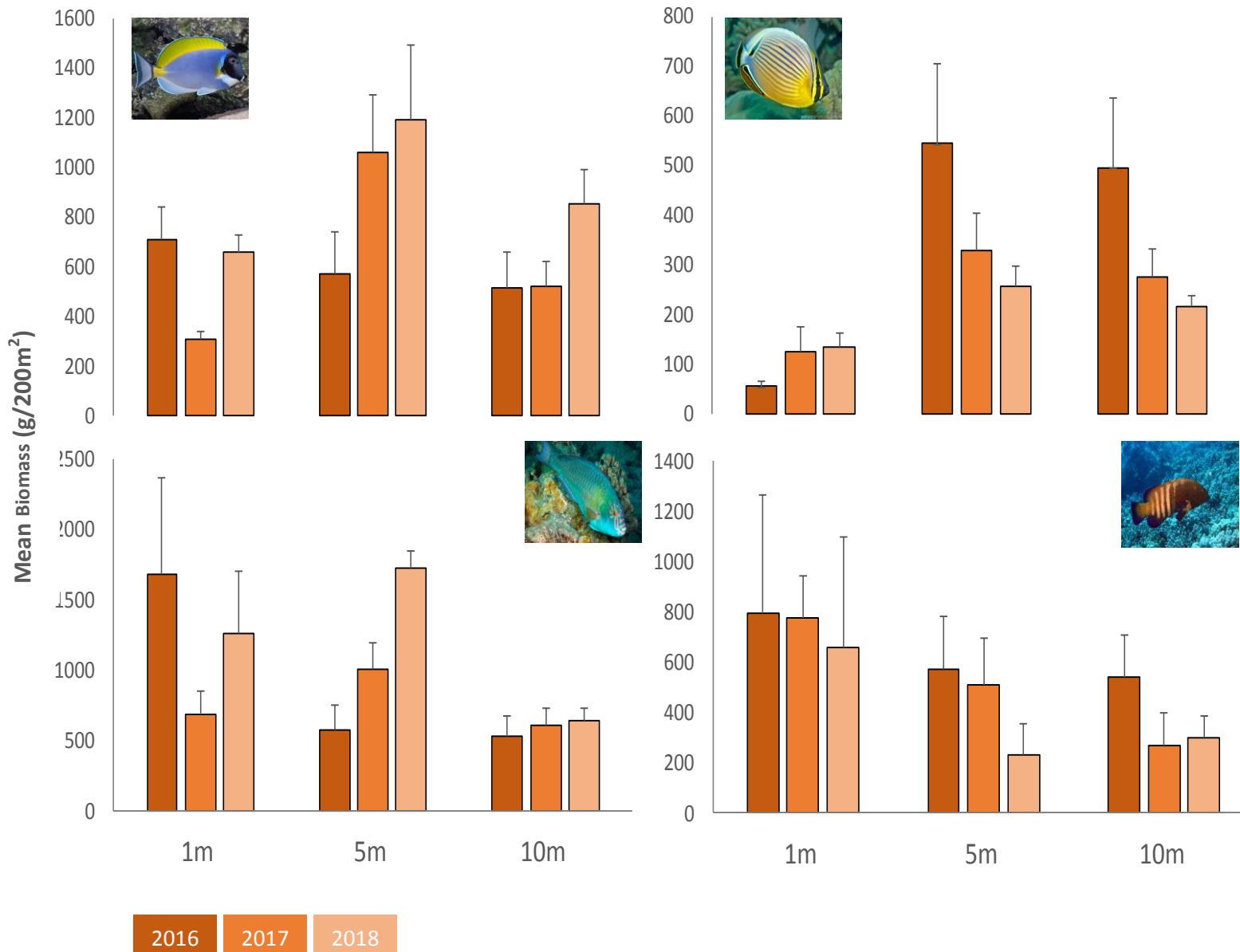
After the bleaching event in 2016, butterflyfish biomass increased on the top reef due to improved food source (coral). However, biomass declined on upper and middle reef slope in the past three years, contradicting increased coral cover.

Parrot fish biomass increased at 1m and 5m due to increased food availability. In contrast, the top reef abundance declined.

There was a noticeable decline in grouper biomass at all depths and years suggesting continued fishing from local communities.

Surgeonfish biomass increased over the 3 years at 5m and 10m but remained low at 1m.