

# **Report to the International Coral Reef Initiative (ICRI) Monitoring of the Portland Bight Protected Area (PBPA), Jamaica**

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Monitoring of the Portland Bight Cays began on May 28, 2004. Two boats departed from the Port Royal Marine Laboratory (PRML) at the tip of the Palisadoes spit at the mouth of the Kingston Harbour for Portland Bight approximately 13 miles to the southwest. The team comprised 13 members of the Jamaica Coral Reef Monitoring Network (JCRMN) and is shown in Figure 1. The Caribbean Coastal Area Management (CCAM) Foundation coordinator, Brandon Hay, gave guidance on which areas of the cays were best for the surveys.

Five sites on three cays were monitored during the May 28 – 30 exercises. These were Pigeon Island East and West, Big Pelican Cay East and West and Morris Shoal (Figure 2). Reefs at two depths were surveyed at all sites with the exception of Big Pelican, which was quite shallow. A modified Reef Check method was used in the surveys to allow for identification of hard corals and algae to species level, where possible, but at least to the genus level. This information will allow the determination of hard coral species composition and richness as well as which species, if any, dominate on the various cays.



Figure 1: Members of the PBPA survey team: L-R: Krishna Desai, Loureene Jones, Malden Miller, Michelle McNaught, Sean Green, Mark Gold, Marlon Hibbert and Peter Edwards (stooping). Missing: Brandon Hay, Dulcie Linton, Ann Sutton, George Warner and Nathalie Zenny.

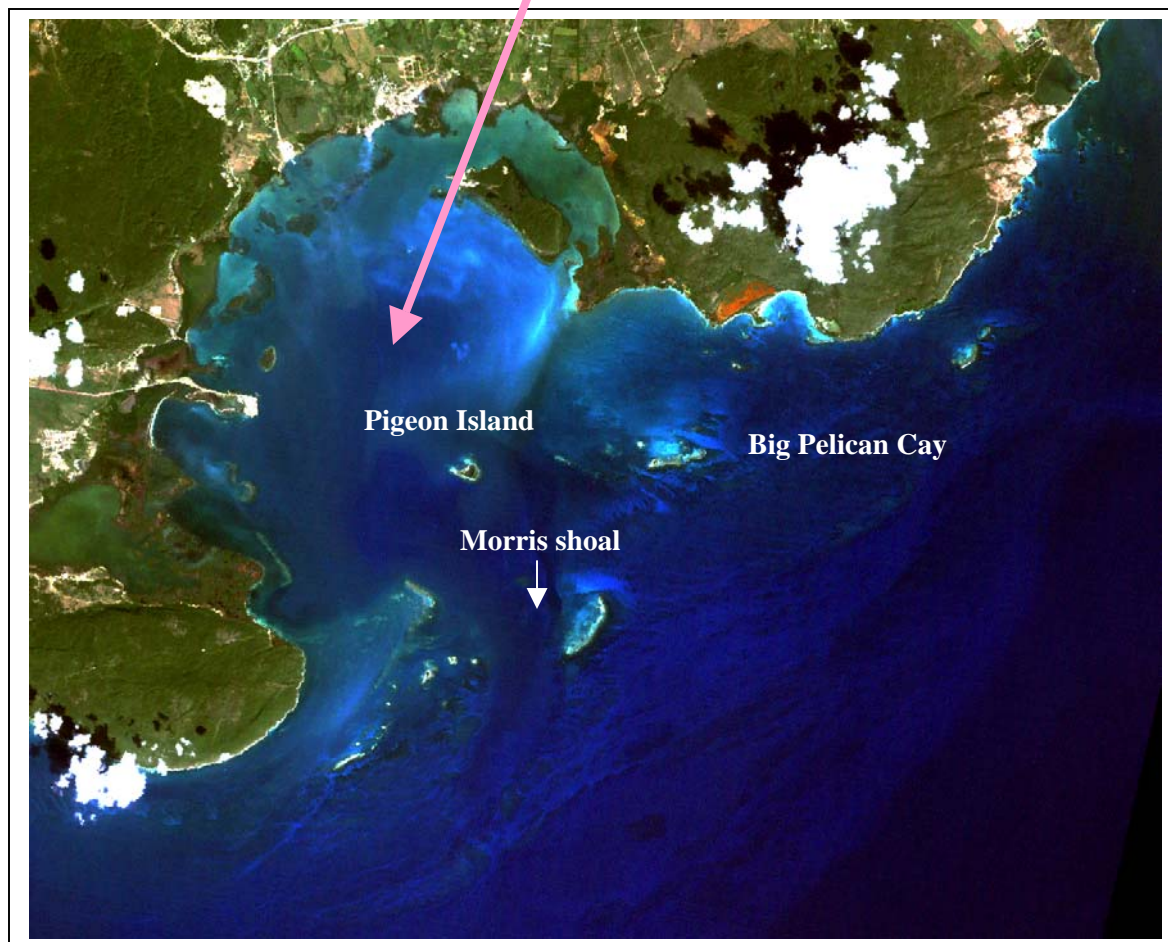
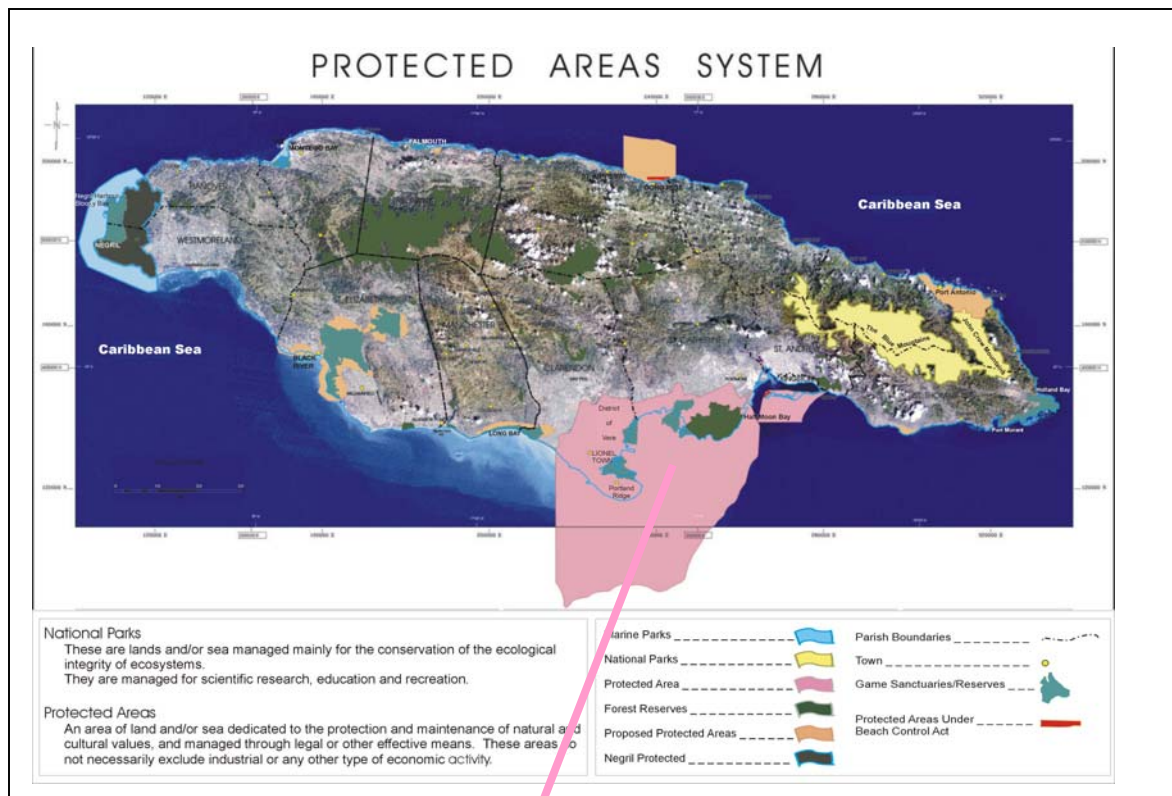


Figure 2. The Portland Bight Protected Area showing the surveys sites

## Substrate

Two of the three cays surveyed appear to be reasonably healthy with percent cover by hard corals ranging from 13.8% to a high of 36.7% (Table 2). Cover by different groups of algae (calcareous, encrusting calcareous, fleshy and turf) ranged from 72.5% to a low of 21.2%. Fleshy algae cover ranged from 0.7 to 26.9%. Soft coral cover ranged from 0.6% to 36%. Generally very shallow reefs (~ 3 m or less) seem to have lower % cover by hard corals.

Thirteen different coral species were identified at the 3 cays surveyed. These included the Caribbean frame-building, branching corals *Acropora palmata* and *cervicornis*, which have suffered severe mortality since the 1980s due to White band disease, large boulder corals such as *Montastraea annularis* and other types, *Colpophyllia* sp., *Diploria* spp, *Porites* spp and *Siderastrea* spp. (Table 3).

The most abundant coral species overall were corals from the *Porites* spp, followed by *Montastraea* spp., *Acropora* spp, *Diploria* spp. and *Siderastraea* spp.

## Big Pelican Cay

Big Pelican Cay is located closest to Manatee Bay, along the Hellshire coastline. The cays are small coral islands with sandy beaches and fringing mangroves.

The reef area around the cay is very shallow, particularly to the east and so all surveys were conducted at 3 - 5 m. This cay has the lowest coral cover of the 3 cays surveyed. Coral cover ranged from 2.5% at 3 m depth at the western site to 25.4% at the eastern site. Nine coral species were identified along the transect line at Big Pelican East, while only 3 were identified at the 3 m depth and 6 at the 5 m depth at Big Pelican West. The dominant coral species were *Diploria* spp, 34.3% of total hard corals, *Porites asteroides*, 24.4%, *Colpophyllia* spp. 16.6%, *Montastraea* spp. 9.9% and *Acropora palmata* 7.4%. Fleshy algae cover averaged 20% and 27% at Big Pelican East and West sites respectively.

## Pigeon Island

Pigeon Island is one of the more well developed coral islands within the PBPA. It has an extensive fringing reef system with relatively good coral cover. Coral cover ranged from 22.5% to 36.7% (Table 1 and Figure 3). At Pigeon Island East ten coral species were identified along the transect line at 4 m depth and 8 at 7 m. The dominant corals (as % of overall coral present) at 4 m were *Porites asteroides* (40%), *Montastrea annularis* (15.5%), *Montastrea cavernosa* (10.9%) and *Millepora alcicornis* (9.1%), while at 7 m the dominant corals were *Acropora cervicornis* (51%) *Porites* spp.(14%), *Millepora alcicornis* (12.3%) and *Agaricia agaricites* (6.3%).

At Pigeon Island West 6 coral species were identified along the transect line at 2 m depth and 8 at 8 m. The dominant corals (as % of overall coral present) at 2 m were *Montastrea*

*annularis* (37.7%), *Porites porites* (20%) *Porites asteroides* (19.6%), and *Millepora alcicornis* (14%), while at 8 m the dominant corals were *Porites asteroides* (52.5%), *Porites porites* (9.7%), *Agaricia* spp.(9.5%) and *Siderastrea siderea* (6.4%). Fleshy algae cover averaged 4.4% and 14.5% at Pigeon East and West sites respectively.

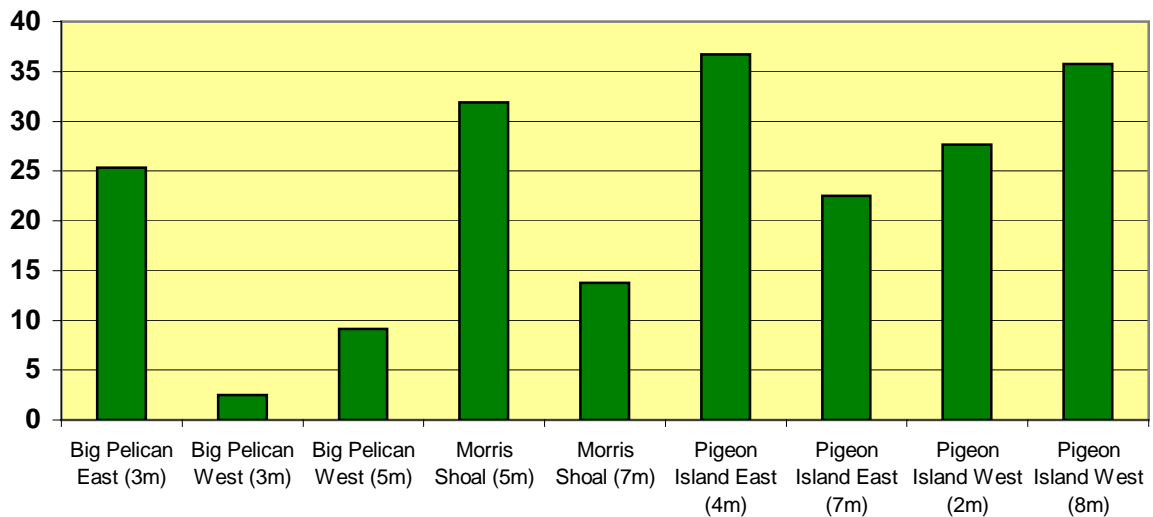
### Morris Shoal

Morris Shoal is a submerged reef comprised of coral rubble. Coral cover was 13.8% at the 7 m depth and 31.9% at 5 m. Coral diversity (along the 100 m transect line) was low with only 6 species identified at 5 m and 5 at 7 m. Dominant corals at both depths were *Porites asteroides* (74.5% and 50% at 5m and 7 m respectively) and *Porites porites* (13.7%) at both depths. Fleshy algae cover averaged 13.8%.

**Table 1. Percent cover by hard corals at cays of Portland Bight**

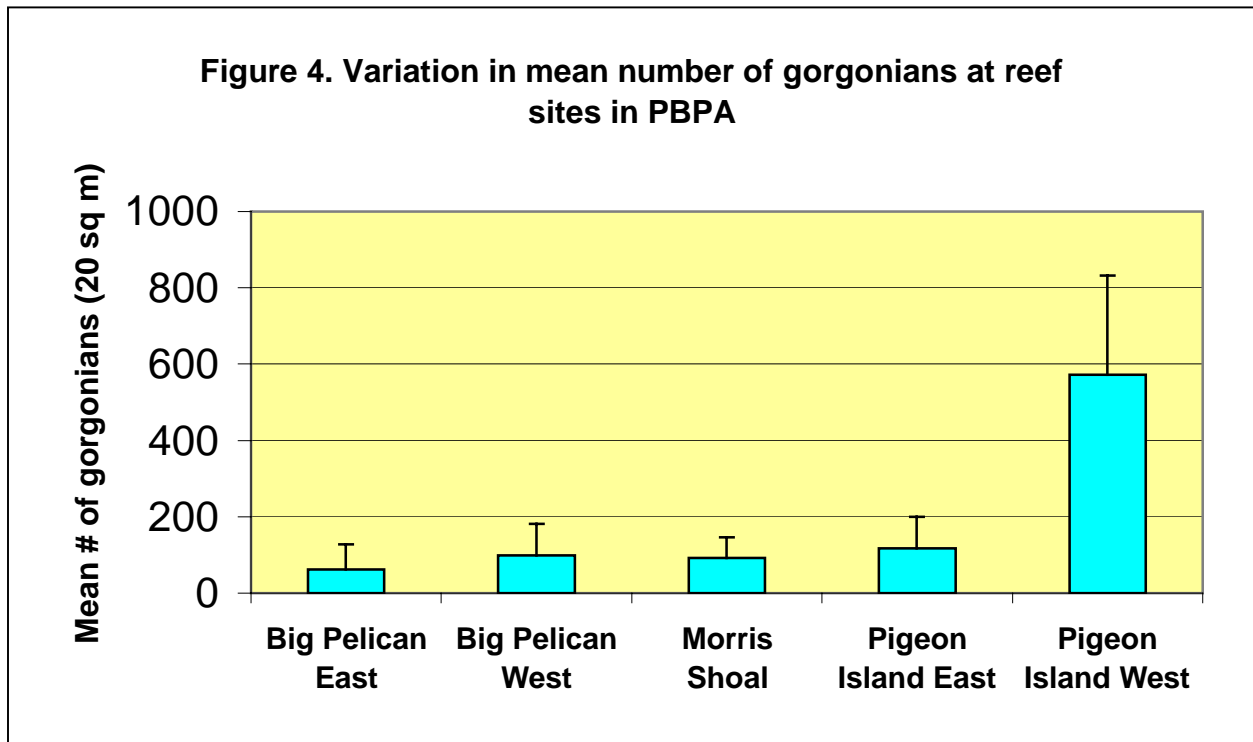
Site	Date	Depth (m)	Substate Code	Mean % cover	SD
Big Pelican East (3m)	30-May-04	3	HC	25.36	10.57
Big Pelican West (3m)	29-May-04	3	HC	2.50	2.04
Big Pelican West (5m)	29-May-04	5	HC	9.14	5.36
Morris Shoal (5m)	29-May-04	5	HC	31.88	7.47
Morris Shoal (7m)	29-May-04	7	HC	13.75	4.33
Pigeon Island East (4m)	28-May-04	4	HC	36.72	17.30
Pigeon Island East (7m)	28-May-04	7	HC	22.52	10.12
Pigeon Island West (2m)	28-May-04	2	HC	27.67	16.04
Pigeon Island West (8m)	28-May-04	8	HC	35.73	6.00

**Figure 3. Ranges of cover by hard corals at the 5 survey sites**



The density of key invertebrates such as the long-spined black urchin, *Diadema antillarum* and *Tripneustes ventricosus* was very low. Both urchins were only found at the Big Pelican East and West sites and *Diadema* averaged only 0.25 individuals per 20 sq m, while *Tripneustes* averaged 2 individuals per 20 sq m.

Gorgonians, in contrast, were abundant at all sites surveyed, averaging 62.8 individuals per 20 sq m at Big Pelican East, 99.3 individuals per 20 sq m at Big Pelican West, 91.9 individuals per 20 sq m at Morris Shoal, 117.1 individuals per 20 sq m at Pigeon Island East and 571.6 individuals per 20 sq m at Pigeon Island West (Figure 4).



### Conclusions:

The reefs of the PBPA surveyed to date show variable cover by hard corals and other benthic substrates. The reefs of Pigeon Island show the highest coral species diversity and generally had higher coral cover than the other sites. Reefs of Big Pelican cay were more degraded and may possibly be more affected by land-based activities. Additional surveys of the cays of the PBPA will be conducted to determine the ranges of coral and other benthic substrate cover and to determine the coral species richness of the area.