

ASSESSMENT OF IMPACT OF FILL MATERIAL
PLACED OFF THE NORTHWESTERN POINT
OF THE ISLAND OF
LITTLE ST. JAMES

INTRODUCTION

Bioimpact, Inc. was contracted by LSJ, LLC. to conduct a detailed benthic survey of the area of impact on the northwestern point of the island. The Department of Planning and Natural Resources issued a Notice of Violation on March 8, 2012 in response to findings made by Fish and Wildlife during a December 2011 field visit. In the following report Bioimpact has delineated the area of impact, and documented the impacts which are believed to have occurred. The assessed impacts are based on dive surveys and review of existing data and previous surveys of the shoreline. The changes found on the site are not a result of natural causes.

BACKGROUND

On March 8, 2012 the Department of Planning and Natural Resources issued a Notice of Violation to Nautilus, Inc. The Notice of Violation (NOVA) was in response to findings of a December 8, 2011 site visit by the Division of Fish and Wildlife, the NOVA stated that the Division of Fish and Wildlife which found that material had been excavated and disposed of in the nearshore environment. The area in which the fill was placed is habitat for *Acropora palmata* and *Acropora cervicornis* which are federally listed species on the Endanger Species List.

In 2009 Brian Moseley and Associates, in response to a COE Notice of Non-compliance, conducted a survey comparing the 2009 shoreline to the 2003 shoreline. The 2003 survey line was created using existing survey data and digitized 2003 aerial photographs. The survey showed that the shoreline was altered between the 2003 and 2009. The 2009 survey line shown on the comparison survey is what is reflected in the August 18, 2009 Google aerial. An overlay of the aerial and the survey are provided on the following page.



Figure 1: The February 17, 2009 survey conducted by Brian Moseley and Associates overlain the August 18, 2009 Google aerial. The blue arrow represents the 2009 shoreline the red arrow the 2003 shoreline as drawn from aerial and survey data.

The 2009 Google aerial is the most recent aerial available on Google Earth and is what is utilized in the following assessment.

FINDINGS

A survey using a hand held Garmin GPS was utilized to determine the extent of fill material which extends from the point out along the top of a shallow rock outcropping. The fill material consists of riprap boulders, smaller stones and a sandy core area which has been reworked by a backhoe or bulldozer that extends out into the riprap from the previously existing drive.



The fill material extends offshore from the point on shallow pavement and rock outcroppings.



Sandy material extends part way out the created groin which then narrows to all riprap. The northern slope of the riprap is much steeper than the southern and western slopes.



This sign is at the base of the slope and is approximately 10ft. from the base of the building. As shown in the large photograph above, the riprap now extends out 140ft. from the sign. GPS readings were taken with a Garmin Hand Held GPS at the sign and at the outer edge of the emergent riprap.



Figure 2: Shown above are GPS readings taken at the site in May 2012, the GPS places the outer edge of the riprap 80ft. from the 2009 shoreline. Because of the sea conditions and steepness of the northern riprap face the width of the groin could not be accurately measured with the GPS.

From the aerial showing the GPS points above it is apparent that additional material has been placed in the sea. It would appear that somewhere between 1000 and 1250 sq. ft. of benthic habitat was directly impacted by the placement of fill. It appears that the fill material impacted very shallow tidally areas

out to a depth between 1' and 18" to the south and to the north the impacts go deeper to as much as a depth of 5ft. because of stones falling into the grotto which runs along the point.

Dive surveys were conducted in May and June of 2012 to assess the impact of fill. It was fairly rough on all days surveyed but seas did calm sufficiently to allow for a thorough survey. The new fill material is visibly different than the older natural and older fill material found farther to the south along the riprap.



The older material along the areas where the new material was not deposited has encrusting algae and crustose coralline algae covering between 10-80% of its surface. Most of the smaller rocks are worn smooth due to being tumbled by the waves.



The new material looks very different, has rougher edges and has not yet become as colonized to the same degree the older material has. The new material has no more than 10% coverage by algal species.



The fill material appears to have been carefully placed rather than dump, which limited the extent of the damages caused directly by its placement.

IMPACTS OF THE PLACEMENT OF FILL

On the southern side of the jetty there has always been less colonization and therefore impacts to the southern portion of the fill would not be as significant as the areas to the north. The most recent survey of the area conducted in 2009 found that less than 5% of the area in the shallows on the southern side of the mid-line of the pavement crest had live coral colonization. The northern side and crest of the shallow ridge had between 10-20% live coral colonization per meter square excluding *Millepora spp.* and as much as 60% benthic coverage per meter square including *Millepora spp.*

Approaching the south side of the new fill material there are areas where fire coral extends out from under boulders and in one area a *Porites astreoides* has survived between two boulders. In the southern portion of the groin the new boulders were placed on top of areas with abundant boring urchins *Echinometra luncata* in the rocks, fire coral colonization and scattered small head corals.



The *Porites astreoides* amid the boulders on a natural rock shows that corals were present in this area of the hard bottom where the rocks and riprap were placed.



The hard bottom immediately off the end of the new riprap has *Millepora*, and scattered small head corals. The last piece of riprap is evident in the left hand corner of the picture. This is a good representation of the habitat that existed under the southern portion of the riprap.

The northern portion of the riprap extends into an area with much denser colonization. A study was conducted in 2009 and the habitat and *Acropora* in the area were mapped.

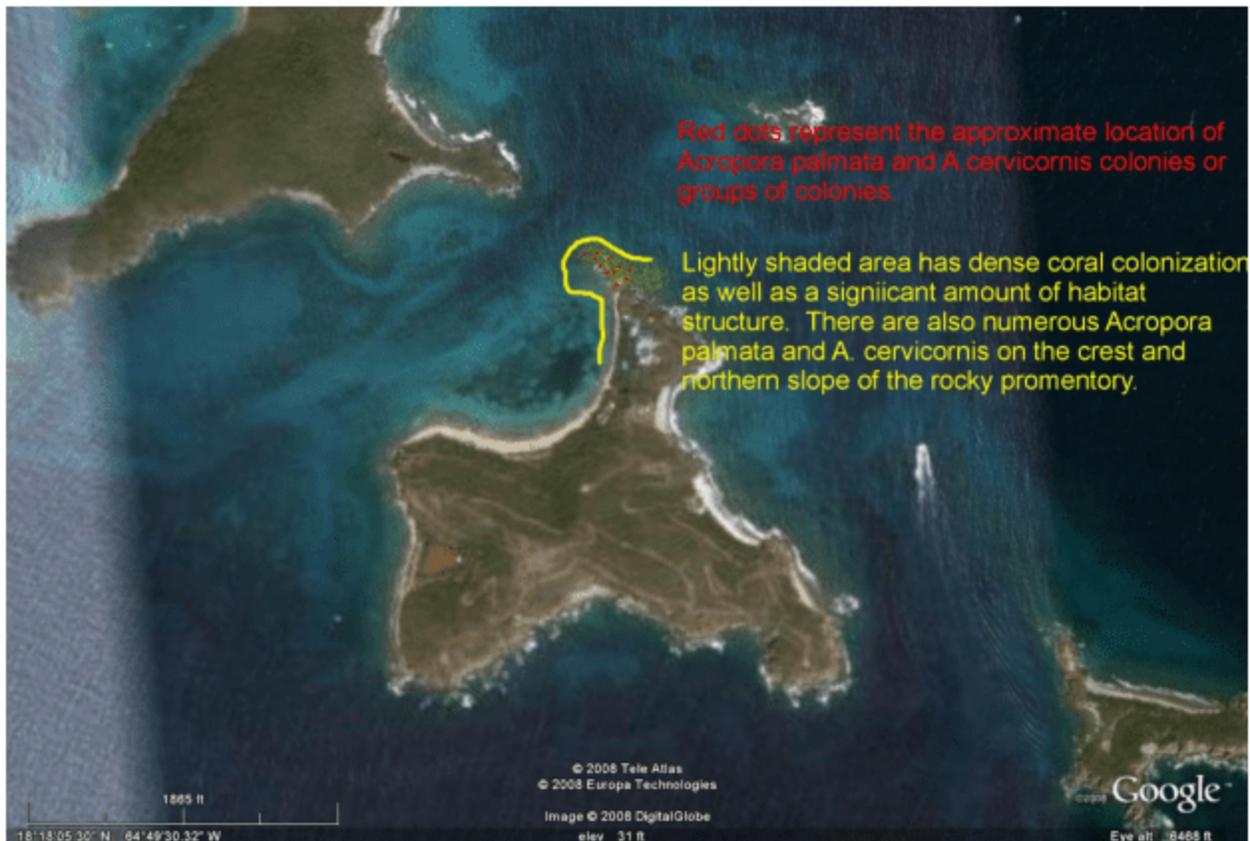


Figure 3: This figure shows the area of habitat has well as the approximate location of the Acropora colonies in 2009.

The locations of the 2009 *Acropora* have been mapped on the current aerial and based on the mapped fill, 3 *Acropora* were directly impacted by the filling activity.

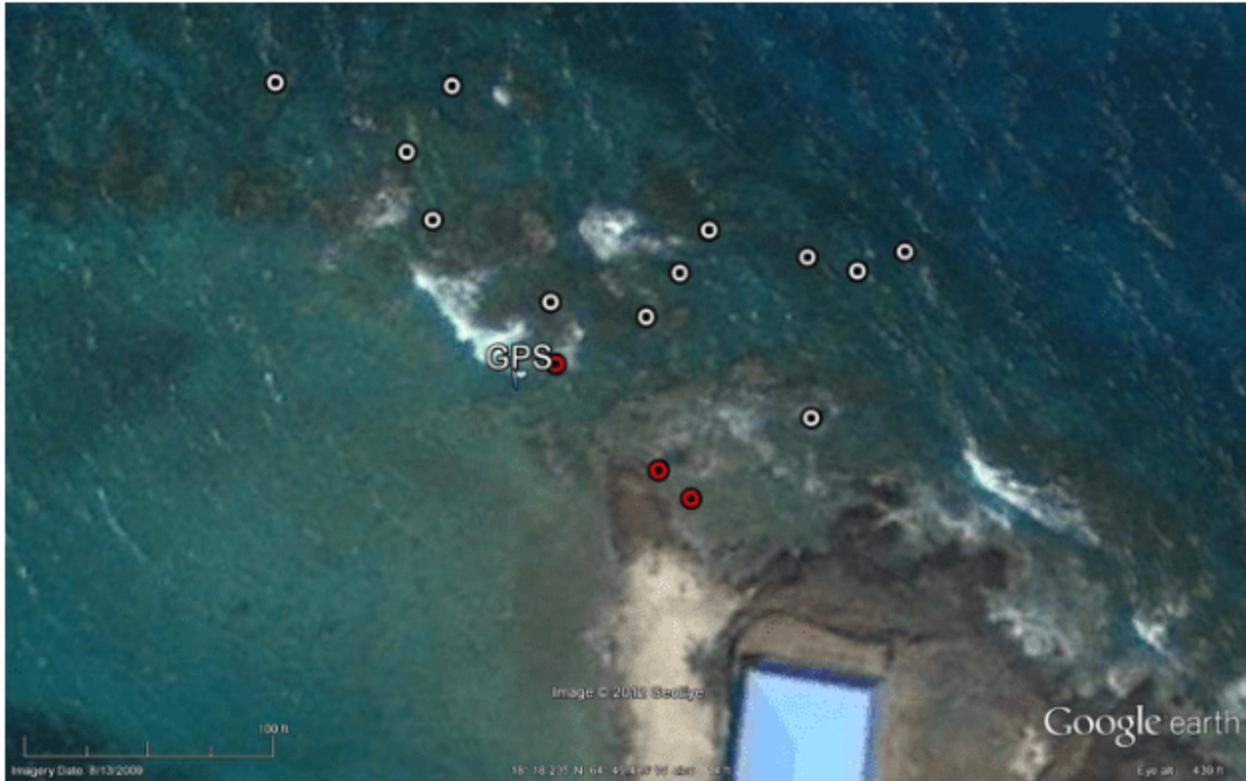


Figure 4: The *Acropora* which were impacted by the placement of fill are shown in red.

The 2009 report stated that there numerous *Acropora* colonies on the northern side of the existing rocky outcropping but not on the southern side. The following photographs are from the 2009 surveys.



Acropora palmata off the point.



Acropora cervicornis on the northern side of the rocks



Acropora cervicornis on the northern side of the rocky outcropping

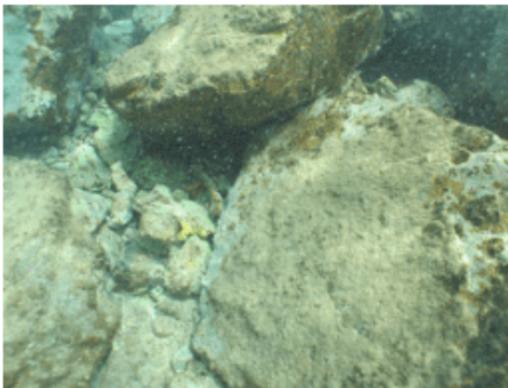


Acropora palmata on the shallow rocks

To the north it appears that the new riprap was placed on top of areas with encrusting fire coral as well as encrusting gorgonians (*Erythropodium caribaeorum*), and hard corals including at least 3 *Acropora palmatas*.



This broken branch of an *Acropora palmata* lies just off the end of the expanded groin. The branch is putting out new branches but is not attached to the seafloor and is subject to movement.



Another broken limb of *Acropora palmata* at the edge of the new riprap, this fragment is not doing as well because of its location in a crevice.



The boulders here are sitting on top of fire coral as well as a *Porites astreoides*.



Corals extending out from under boulders and small stones along the northern edge of the groin.

The fill material directly impacted between 1000 and 1250 sq.ft. of coral habitat, the southern portion was sparsely colonized while the crest and northern slope was more heavily colonized. At least 3 *Acropora palmata* were directly impacted and the entire area was critical habitat for these species. The hard bottom habitat was also colonized by *Porites astreoides*, *Porites porites*, *Diploria strigosa*, and *Millepora* spp. There was also some coverage by encrusting gorgonians (*Erythropodium caribaeorum*) and numerous boring urchins, *Echinometra* and black urchins, *Diadema antillarum* also colonized the shallow environment. These organisms were denser to the north of the crest than the south.

The filling probably also had indirect impacts through the introduction of fines from the riprap and from the sandy fill material which escaped through the rocks.

REMEDICATION

The removal of the material could probably be accomplished in 3 days using equipment that the owner of Little St. James has on island and the material could be disposed of in upland areas on the island. The cost of the operation would be approximately \$1500.00. The removal would require environmental and water quality monitoring and the re-attachment of corals knocked loose during the process would cost around \$6000.00. Therefore the cost of restoring the area to greatest extent possible would cost Nautilus Inc. approximately \$6750.00.

The removal of the material would most likely result in additional impacts to the surrounding environment through direct impacts to the viable corals at the edge of the fill material and through the re-suspension of fine sediments released into the water column as the material is removed.

Because of the additional damage that would occur to remove the materials. Nautilus Inc. is proposing to conduct off-site, in-kind mitigation by protecting additional *Acropora* habitat. Nautilus Inc. would fund placement of 3 public mooring buoys protecting a total of 1250 sq. ft. of coral habitat placed in locations selected by DPNR. Nautilus, Inc. would also protect additional *Acropora* habitat through the cleanup of debris from areas where wrecked vessels have impacted the shallow water environment and the continued presence of this debris continues to pose a threat to nearby corals as it is moved in the waves. The proposed sites of cleanup will be selected and approved by DPNR. Cleanup of the selected

debris should protect more than 1250 sq. ft. of coral habitat. The total cost of mitigation would exceed more than \$12,500.00, two times what the cost of removal of the material would cost thereby representing two to one mitigation.