Environmental Impact Assessment

Addendum No 2

Appendices 21-25

NEGRIL PENINSULA RESORT

WEDDERBURNS, WEST END, NEGRIL, WESTMORELAND.

Prepared by: Negril Peninsula Resorts Ltd

9th June 2007

APPENDIX 21

Nocturnal Studies

On the evening of the Public Presentation, 8th May 2007, there were two concerns in connection with nocturnal animals. One concern came from Ms Danielle Andrade, representing JET and JEAN. Ms Andrade stated her concern that there were no nocturnal studies taken and that an endangered species, the Yellow Boa, is a nocturnal animal. Also Ms Jean Brown of NCRPS stated her concern that bats could be present on the site, but no nocturnal study had been undertaken.

Paula Hurlock, who represented the EIA consultant team who compiled the Terrestrial Biological Environment chapter within the EIA, concurred on the evening that the E.I.A. would benefit from a nocturnal study and stated that one would be undertaken and submitted to NEPA.

This nocturnal study has now been completed by, Dr Eric Garraway, Invertebrate Specialist and Dr.Peter Vogel, Vertebrate Specialist both from the Department of Life Science at the University of the West Indies.

An updated Terrestrial Biological Environment report has also been completed, as a result of the nocturnal study and both documents are included in this appendix.

For the avoidance of doubt, if there is any conflict between the original Terrestrial Biological Environment report, that was at Chapter 2 of the original E.I.A. Report and the updated one included in this appendix, then the contents of this appendix takes precedence

CHAPTER 2: TERRESTRIAL BIOLOGICAL ENVIRONMENT

2.1 VEGETATION

2.1.1 Methodology

This survey was conducted over a period of seven days between October 22 and October 29, 2006. Due to the extremely degraded condition of the entire site (and therefore the absence of different forest types as per The land use classification system developed by the Forestry Department (Camirand and Evelyn, 2003). the vegetation survey was conducted primarily through qualitative field surveys supported by literature research and aerial photo interpretation and not detailed quadrat sampling and transects. Applying the USEPA's "rule of reason" where the level of investigation must be commensurate with the level of concern, the quality of the vegetation cover was deemed not likely to be impacted (except through net loss) by the implementation of this project. Field surveys were done to verify vegetation description, abundance, composition and distribution within the context of characterizing the area's ecology. Verification was sought from Jamaica's only Plant taxonomist, Dr. George Proctor and Mr. Andreas Oberli in the identification of 2 rare and endangered plant species found within the study area.

2.1.2 Characterization of the area's ecology

Two of the Forestry Department's land use categories cover the study site (Fig. 1):

- Fields: anthropogenic herbaceous communities that may include scattered scrub and trees
- Mixture of disturbed forest (51-75%) and fields (26-50%): fragmented and degraded woodland, interspersed by open areas.

No natural forest has remained within the study site. Areas with continuous soil cover have all been converted to pasture, and wooded vegetation is mainly restricted to rocky substrates. Some of the best maintained forest features occur along the steep rocky cliffs. (fig.3)

For the purpose of the present study, the following habitat types are distinguished (Fig. 2)

- Disturbed Forest (16.9% of total site area)
- Ruinate (28.0%)
- Pasture (37.8%)
- Coastal Scrub (15.6%)
- Shore Woodland (1.7%)

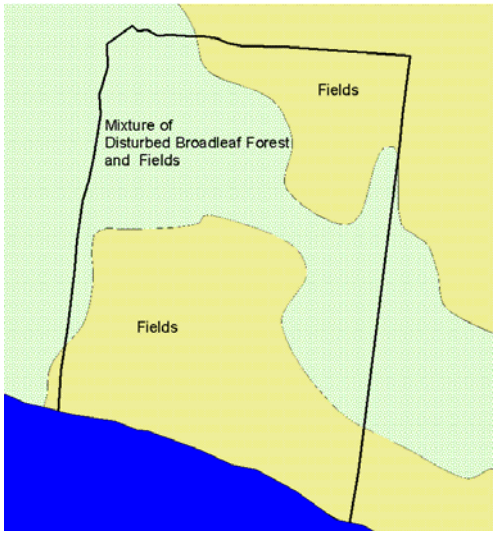

Fig.1. Land use classes in study site according to Forestry Department. (Camirand and Evelyn, 2003).

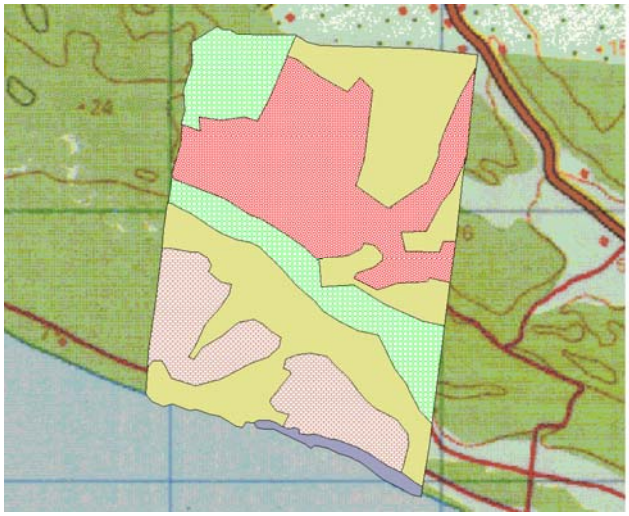

Fig.2. Habitats distinguished in present study.

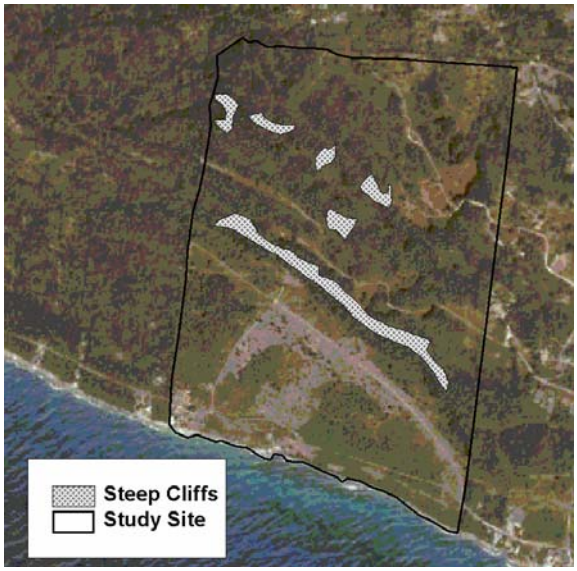

Fig.3. Cliffs within the study area

2.1.3 Vegetation description abundance and composition

The most striking observation made about the site is that it is strongly converted and degraded. No natural forest has remained within the study site. Areas with continuous soil cover have all been converted to pasture, and wooded vegetation is mainly restricted to rocky substrates. Some of the best maintained forest features occur along the steep rocky cliffs. There was no intact, undisturbed, natural forest left on the entire site. In fact better forest areas occur outside the study area. (Site characterization by Garraway and Vogel May 2007).Three distinct topographical zones were identified and a description of the vegetation occupying these zones was done. These zones were made up of a mixture of the habitats characterized in section 2.1.2 above:

1. **Coastal plains**- (shore woodland, pasture, coastal scrub)a significantly degraded area , relatively flat, consisting of sandy infertile soil. Ground cover is dominated by shrubs. The coastal plains were dominated for the most part by Cashaw macca (*Prosopis juliflora)*, fern(*Polypodium sp*.) Bull hoof (*Bauhinia divaricata*) ,Logwood (*Haematoxylum campechianum)*
2. **The Limestone Cliff Face/Escarpment Shelf (Ruinate, disturbed forests) a** section of the site which shows impacts due mainly to deforestation and forest fire. The vegetation is typical of that of dry limestone pavement vegetation on solid limestone substrate and honeycomb rock. The plants are adapted to this habitat with leathery microphyllus leaves as well as leaves which are succulent. Characteristic chamaeophytes include Argusia gnaphalodes (seaside lavender), Borrichia arborescens (seaside ox-eye), Ernodea littoralis,, Jaquinia keyensis , Morinda royoc , Rachicallis Americana and Suriana maritime (Bay cedar). The area is dominated to a great extent by Thrinax sp, epiphytic, orchids, bromeliad (both hohenbergia spp and Tillandsia spp) , agaves and cacti.
3. **The Higher Shelf (Disturbed Forests)-**This limestone dominated plateau had a dense assemblage of trees dominated by Red Birch (*Bursera simaruba*) and Dogwood (*Piscidia piscipula*),Bastard ceder (*Guazuma ulmifolia), White Ironwood (Alteramnus lucius), White Bullet (Bumelia salicifolia)* as well as Thatch Pole (Thrinax parvifolia), Bull Thatch (Sabal jamaicensisi) , Maiden Plum (Comocladia pinnatifolia) and Yucca (Agave sp). This area carried the most continuous canopy cover with low light penetration although the under storey was

quite open in some instances. Groundcover was predominantly saplings of the larger species.

2.1.4 Occurrence at Site

Tables 1 and 2 are lists of species encountered on site. The DAFOR scale (Dominant, Abundant, Frequent, Occasional, and Rare) was used to categorize abundance of only the rare and endemic species.

Table 1: Vegetation species observed at the Site.

Common names	Scientific names	Family	
Dogwood	*Piscidia piscipula*	Leguminoceae	
Lucky nut	*Thevetia peruviana*	Apocynaceae	
White Ironwood	*Alteramnus lucius*		
White Bullet	*Bumelia salicifolia*		
Thatch Pole	*Thrinax parvifolia*		
Bull Thatch	*Sabal jamaicensisi*		
Maiden Plum	*Comocladia pinnatifolia*		
Seaside lavender	*Argusia gnaphalodes*		
Seaside ox-eye	*Borrichia arborescens*		
f ern	*Polypodium sp*		
	Ernodea littoralis		
	Jaquinia keyensis		
	Morinda royoc		
	Rachicallis Americana		
Bay cedar	*Suriana maritime*		
Fig	*Ficus membranacea*	Moraceae	
Cotton Tree	*Ceiba pentandra*	Bombacaceae	
Bastard Cedar	*Guazuma ulmifolia*	Sterculiaceae	
Guango	*Samanea saman*	Leguminoceae	
Cashaw macca	*Prosopis julifolia*	Leguminoceae	
Fiddle wood	*Citharexylum cauatum*	Verbenaceae	
Log wood	*Haematoxylum campechianum*	Leguminoceae	
Bull Hoof	*Bauchina divaricata*	Leguminoceae	
Prickley Yellow	*Zanthoxylum martinicense*	Rutaceae	
Sweet wood	*Licaria triandra*	Lauruceae	
Wild tamarind	*Phecellobium arboreum*	Leguminoceae	
Spray orchid	*Doritaenopsis dorette*	orchidaceae	
Pretty pineapple	*Billbergia pyramidalis*	Bromeliaceae	
Giantwild pine	*Hohenbergia spinulosa*	Bromeliaceae	
wild pine	*Hohenbergia urbaniana*	Bromeliacea	
Wicker		Araceae	
Yellow sanders	*Zanthoxylum flavum*	Rutaceae	
Guinea grass	*Panicum maximum*	Poaceae	
Cerasee		Araceae	
Caster oil	*Ricinus communis*	Euphorbiaceae	
Black jointer	*Piper amalago*	Piperaceae	
Broom weed	*Sida acula*	Malvaceae	
Broom weed	*Rivina humilis*	Phylolaccaceae	
Sweet wood	*Licaria triandra*	Lauraceae	
Logwood	*Haematoxylum campechianum*	Leguminoceae	

Table 2: Endemic and Rare and Threatened Plants observed on the site

Species	***Form***	Status	***Abundance***
Tropida polystachya	Orchid	Endemic	***Rare***.
Zamia amblyphyllidia	cycad	Endemic (Criticallyendangered)	Rare
Hohenbergia negrilensis	epiphyte	endemic	Frequent
Agave Oberlii	Agave	Endemic (Critically Endangered)	Frequent

Plate 1: Sections of the Wedderburn Estate (looking south)

Plate 2: Shrub dominated coastal plain

Plate 3: Rock outcrops along the Hill slopes

Plate 4: Property shows secondary re- growth

Plate 6: Vegetation found on the main plateau

Plate 7: Feeding trees for birds

2.2 TERRESTRIAL FAUNA

2.2.1 Avifauna

Avi-faunal surveys took place between October 22 and 29, 2006 and May 27 and 29,2007 and included both dusk and dawn assessments. Fifty-two (52) species of birds from 29 families were observed during the walkthroughs. Of this number 13 are Jamaican endemics and 7 are endemic sub-species. Four species of nocturnal birds could be confirmed within the study site during the night survey: Yellow-crowned Night Heron, Northern Potoo, Common Barn Owl and Jamaican Owl. None of these species is considered threatened by IUCN. (See nocturnal study report) Overall the area had high bird diversity. Based on the survey the study area supports approximately 60% of Jamaica's extant endemic bird species. Due to the degraded nature of the habitat and tree species composition, the area was not expected to be important for any of Jamaica's more sensitive endemic species. It is likely that the majority, occur preferentially in the closed canopy well-developed forests surrounding the study area.

Nocturnal Birds

Four species of nocturnal birds could be confirmed within the study site during the night survey: Yellow-crowned Night Heron, Northern Potoo, Common Barn Owl and Jamaican Owl. None of these species is considered threatened by IUCN.

The **Yellow-crowned Night Heron** (*Nycticorax violaceus*) is a common resident on beaches and in wetlands (Downer and Sutton 1990). Two individuals were observed in the day roosting on trees along the shore of the study site. They were not observed in the night. The probably had left the roosting area to forage elsewhere, since the rocky shoreline of the site does not provide suitable feeding grounds. When flooded after heavy rains, the flat pasture along the shoreline might be visited by foraging night herons.

The **Northern Potoo** (Nyctibius *jamaicensis*) belongs to a small family of nocturnal birds in tropical America. In Jamaica, it is a locally common resident in woodlands, and along wooded areas bordered by open clearings with scattered trees (Downer and Sutton 1990). During the night survey, the distinctive voice of two Potoos were heard, one along the pasture on the edge of the ruinate, and the other in the disturbed forest.

The **Common Barn Owl** (*Tyto Alba*) has a worldwide distribution. In Jamaica, it is a common bird of open or partly-open areas from sea level to the mountains (Downer and Sutton 1990). During the night survey, the owl was heard and seen often in all pasture areas.

The **Jamaican Owl** (*Pseudoscops grammicus*) represents a genus and species that is endemic to Jamaica. It is widespread at all elevations in forests, but also can occur in open spaces with isolated trees (Downer and Sutton 1990). During

the night survey, at least 6 different individuals were heard in the ruinate and the disturbed forest.

Table 2. Species encountered at the Western end region of Negril – Wedderburn Estate

FAMILY	SCIENTIFIC NAMES	COMMON NAMES	STATUS/RANK	ABUNDANCE
Accipitridae	*Buteo jamaicensis*	Red-tailed Hawk		O
Apodidae	*Tachornis phoeicobia*	Antillean Palm Swift		O
Ardeidae	*Bubulcus ibis*	Cattle Egret		F
Ardeidae	*Egretta thula*	Snowy Egret		F
Cathartidae	*Cathartes aura*	Turkey Buzzard		F
Coerebinae	*Coereba flaveola*	Bananaquit *	Endemic at sub species level	F
Columbidae	*Columba leucocephala*	White-crowned Pigeon	vulnerable	R
Columbidae	*Columbina passerina*	Common Ground Dove		D
Columbidae	*Zenaida aurita*	Zenaida Dove		R
Columbidae	*Zenaida asiatica*	White winged dove		R
Columbidae	*Zenaida macroura*	Mourning Dove		D
Columbidae	*Leptotila jamaicensis*	Caribbean Dove*	endemic at sub species level	O
Emberizinae	*Ammodramus savannarum*	Grasshopper Sparrow		R
Emberizinae	*Loxipasser anoxanthus*	Yellow-shouldered Grassquit	endemic	F
Emberizinae	*Tiaris bicolor*	Black-faced Grassquit		A
Emberizinae	*Tiaris olivacea*	Yellow-faced Grassquit		D
Falconidae	*Falco sparverius*	American Kestrel		D
Fringillidae	*Loxigilla violacea*	Antillean Bullfinch*	Endemic at sub species level	A
Hirundinidae	*Hirundo fulva*	Cave Swallow		R
Icteridae	*Quiscalus niger*	Greater Antillean Grackle	Endemic sub species level	A
Icteridae	*Icterus leucopteryx*	Jamaican Oriole	Endemic sub species level	R
Icteridae	*Molothrus bonariensis*	Shiny Cowbird	invasive	O
Mimidae	*Mimus polyglottos*	Northern Mockingbird		R
Picidae	*Melanerpes radiolatus***	Jamaican Woodpecker	endemic	F
Psittacidae	*Aratinga nana***	Olive -throated Parakeet *	Endemic sub specie	A
Strigidae	*Pseudoscops grammicus*	Jamaican Owl	endemic	R
Strigidae	Nyctibius *jamaicensis*	Northern Potoo		O
Strigidae	*Tyto alba*	Common Barn Owl		O
Ardeidae	*Nycticorax violaceus*	Yellow-crowned Night Heron		O
Thraupinae	*Euphonia jamaica***	Jamaican Euphonia	endemic	O
Thraupinae	*Euneornis campestris*	Orangequit	endemic	O
Thraupinae	*Spindalis nigricephala*	Jamaican Stripe-headed Tanager	endemic	R
Trochilidae	*Anthracothorax mango*	Jamaican Mango	endemic	F
Trochilidae	*Mellisuga minima*	Vervain hummingbird*	endemic at sub-species level	F
Trochilidae	*Trochilus polytmus***	Red-billed Streamertail	endemic	F

FAMILY	SCIENTIFIC NAMES	COMMON NAMES	STATUS/RANK	ABUNDANCE
Turdidae	*Turdus jamaicensis***	White-chinned Thrush, Hopping Dick	endemic	F
Tyrannidae	*Myiarchus barbirostris***	Sad Flycatcher	endemic	O
Tyrannidae	*Myiarchus validus***	Rufous-tailed Flycatcher	endemic	O
Tyrannidae	*Myiopagis cotta*	Jamaican Elaenia	endemic	O
Tytonidae	*Tyto alba*	Common Barn Owl		F
Vireonidae	*Vireo modestus*	Jamaican Vireo	endemic	R

Table 3: Sea and Shore Species Observed in the Western end of Negril

Family	SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Pelecanidae	*Pelicanus occidentalis*	WI Brown Pelican		F
Laridae	*Larus atricilla*	*Sea Gull*		F
Laridae	*Sterna maxima*	*Royal tern*		O
Fregatidae	*Ardea cinerea*	*Grey Heron*		O
Fregatidae	*Fregata magnificens*	*Magnificent Frigate Bird*		O
Ardeidae	*Egretta caerulea*	*Little Blue Heron*		O

Table 4 : Winter Migrant Species Observed in Western End of Negril

Family	SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Coccyzidae	*Coccyzus americanus*	Yellow-billed Cuckoo		O
Parulidae	*Dendroica caerulescens*	Black-throated Blue Warbler		R
Parulidae	*Dendroica coronata*	Yellow-rumped Warbler		O
Parulidae	*Dendroica discolor*	Prairie Warbler		O
Parulidae	*Dendroica dominica*	Palm Warbler		R
Parulidae	*Geothlypis trichas*	Common Yellowthroat		R
Parulidae	*Mniotilta varia*	Black and White Warbler		R
Parulidae	*Parula americana*	Northern Parula		R

2.2.2 Invertebrate Fauna:

The area though degraded in nature was rich in insects, bugs , moths and butterflies. 154 species of insects are known to and observed in the study area. 18 species of Lepidoptera,14 species of Odonata , 10 species of Orthoptera, 12 species of Hemiptera, 15 species of Diptera, 24 species of Coleoptera, 21 species of Hymenoptera and 19 species of snail.

Table 5: Invertebrates known to and observed in the study area of Wedderburn Estate.

FAMILY NAMES	SCIENTIFIC NAMES	COMMON NAMES	STATUS/ RANK
ORDER: LEPIDOPTERA [Moths & Butterflies]			
Arctiidae	*Ammalo helops*		
	Calidota strigosa		
	Eunomia rubripunctata		Endemic
	Cosmosoma achemon		
	Cosmosoma auge		

FAMILY NAMES	SCIENTIFIC NAMES	COMMON NAMES	STATUS/ RANK
	Cosmosoma fenestrata		
	Horama grotei		Endemic
	Empyreuma anassa		Endemic
	Phoenicoprocta jamaicensis		Endemic
	Composia credula		Rare
	Correbidia sp.		
Hyponomeutidae	*Atteva auria*		
Pyralidae	*Diaphina hyalinata*		
	Epipagis huronalis		
	Anania florella		
Sphingidae	*Enyo biosduvali*		
	Erinnyis alope		
Geometridae	*Nepheloleuca foridata*		
ORDER: ODONATA [Dragonflies and Damselflies]			
Aeshnidae	*Coryphaeschana adnexa*	Needle case	
Libellulidae	*Erythemis simplicollis*		
	Erythemis plebeja	Needle case	
	Tramea abdomiinalis	Needle case	
	Tramea insulris	Needle case	
	Tramea binotata	Needle case	
	Erythrodiplax aunrata	Needle case	
	Erythrodiplax bernice	Needle case	
	Dthemis rufinervis	Needle case	
	Macrothemis celeno	Needle case	
	Lepthemis vesiculosa	Needle case	
	Anax junius	Needle case	
	Micrathytyria didyma	Needle case	
	Pantala flavescens	Needle case	
Zygoptera (Damsel flies)	*Unidentified sp.*	Needle case	
ORDER: MANTODEA [Praying Mantis]			
	Stagmomatis domingensis	Praying mantis	
ORDER: ISOPTERA [Termites]			
	Nasutitermes nigricepes	Termite; Duck ants; white ants	
	Procyptotermes cornicepes	Termite; Duck ants; white ants	
ORDER: ORTHOPTERA [Grasshopers & Crickets]			
Gryllidae	*Halpithus sp*	Cricket	
Acrididae	*Orphullela punctata*	Small Grasshopper	
	Neoconocephalus affinis	Grasshopper	
	Stilpnochlora laurifolium	Grasshopper	
Noctuidae	*Ascalapha odorata*	Black Witch, Duppy Bat	

FAMILY NAMES	SCIENTIFIC NAMES	COMMON NAMES	STATUS/ RANK
	Melipotis sp.		
	Sylectra ericata		
	Leucania juncicola		
	Thysania xenobia		
	Cinccia sp.		
ORDER: DERMAPTERA [Earwigs]			
	Euborellia annulipes	Earwig	
	Cabidora rip aria	Earwig	
ORDER: HOMOPTERA [Plant bugs]			
Membracidae	*Tyolzygnus fasciatus*		
Cidadidellidae	*Poeciloscata laticepes*		
ORDER: HEMIPTERA [True bugs]			
Gerridae	*Gerris sp.*		
Pentatomidae (Stink bugs)	*Loxa viridis*	Stink Bug	
	Nezara viridula	Stink Bug	
	Proxy victor	Stink Bug	
	Euschistatus bifibulous	Stink Bug	
	Alcaeorrhyndicus grandis	Stink Bug	
	Proscys victor	Stink Bug	
Cydinidae	*Tominotus communis*		
Rediviidae		Stick insect	
Pyrrhocoridae (Stainers**)**	*Dysdercus jamaicensis*	Police man bug; Love bug	
	Oncopertus sanderchatus		
	Oncopertus pictus		
ORDER: NEUROPTERA [Lace wings & ant lions]			
Chrysopidae	*Chrysopa bicornea*	Ant lion; Nanny Goat	
Myrmelontidae	*Hesperoleon sp.*	Green lace wing	
ORDER: DIPTERA [Flies]			
Tipulidae	*Limonira sp.*	Daddy long leg; crane fly	
Syrphidae (Flower flies)	*Ornidia obesa*		
	Copestylum inatoma		
	Copestylum tamaulipanaum		
	Pseudodorus clavatus		
	Toxomerus pulchallus		
Bombylidae	*Paecillathrax lucifer*	Bee fly	
Stratyomyidae (Soldier flies)	*Hermatia illuscells*	Soldier fly	
Assilidae	*Leptogaster jamaicensis*	Robber fly; bee fly	
	Cerotainia jamaicensis	Robber fly; bee fly	
	Ommatis alexanderi	Robber fly; bee fly	
Tephritidae	*Anastrepha sp*	Fruit fly	
Stphylinidae	*Carpelimus petomus*		
	Carpelimus sp.		
Tenebrionidae	*Tarpela metabilis*		

FAMILY NAMES	SCIENTIFIC NAMES	COMMON NAMES	STATUS/ RANK
ORDER: COLEOPTERA [Beetles]			
Cincindellide	*Cicindela carthagena jamaicana*		
Coccinellidae	*Chalieorus cacti*	Lady bird beetle	
	Cycloneda sauguinea	Lady bird beetle	
Scolytidae	*Xyleborus sp.*	Shotgun borers	
Chrysomelidae	*Coptocyia jamakana*		
	Metriona flavolineata		
	Diabrotica bivittata		
	Disonycha laevigate		
	Homophoeta albicellis		
	Cerotoma ruficornis		
Cerambycidae	*Eburia postica*		
	Oreodera sp.		
	Chlorida festiva		
	Elaphidon spinicorne		
	Neoptychodes trilineta		
	Neoclytus longipes		
	Neocl ytus sp.		
Scarabeeidae (Scarab beetle)	*Paragymentis lanius*		
	Ligyrus fossor		
	Macraspis tetradactyla		
	Strategus sp.	News bug	
	Oniticellus cubiensis	Dung beetle	
	Phanaeus vindex		
Dyticidae	*Unidentified sp.*		
ORDER: HYMENOPTERA [Ants, Wasps & Bees]			
Scolidae	*Compsomeris dorsata*		
	Campsomeris attrata		
Ichneumonidae	*Icheumonus sp.*	Night wasp	
Apidae	*Euglossa jamaicensis*		
	Centris sp.		
	Apis mellifera	Honey bee	
	Exomolapsis sp.		
Megachilidae	*Megachile concina*	Leaf cutter bee	
	Megachile poyei	Leaf cutter bee	
Sphecidae	*Sceliphron asimile*	Mud wasp	
	Zeta abdominalae	Mud wasp	
	Pachydynerus nasidens	Mud wasp	
Vespidae	*Polistes crinitus*	Red wasp	
	Polistes hunteri	Red wasp	
	Polistes major	Big red wasp	
Chalcidae	*Spilochalsis sp.*		
Formicidae	*Paratrechina longicornis*		

FAMILY NAMES	SCIENTIFIC NAMES	COMMON NAMES	STATUS/ RANK
	Crematogaster sp.	Black ant	
	Pheidole sp.	Biting ant	
	Camponutus sp.	Carpenter ant; Big red ant	
	Trachymymex jamaicensis	Gardening ant	Endemic
ORDER: COLLEMBOLA [Springtails]			
	Unidentified sp.	Springtail	
SPIDERS			
	Peucetia sp.	Anancy Spiders	
	Argiope aurunita	Anancy Spiders	
	Micrathena sp.	Anancy Spiders	
	Phalaugium sp.	Anancy Spiders	
MILLIPEDES			
	Julida sp.	Forty leg	
ORDER: IXODES [Ticks]			
	Boophilous microplus	Cattle tick	
ORDER: ISOPODA			
	Unidentified sp.	Woodlouse	
ORDER: OLIGOCHAETA [Earth Worms]			
	Pheretima sp.	Earthworm	
	Proto scolex sp.	Earthworm	
SNAILS			
	Thelidomus aspreera		
	Sagda jayana		
	Sagda anodon		
	Sagda torrefactor		
	Plectocycoltus jamaicensis		
	Lucidella granulosa		
	Lucidella anroela		
	Lucidella sp.		
	Urocoptis aspera		
	Urocoptis brevis		
	Urocoptis sp.		
	Orthalicus undatus		
	Eutrochatella sp.		
	Pleurodonte autalucena		
	Tudora jayana		
	Tudora tectilabris		
	Tudora banksiana		
	Tudora sp.		
	Dentelaria sp.		

2.2.3 Nocturnal Invertebrate Fauna

Eighty six species of insects were identified during the nocturnal survey (see Appendix); 31 species of Lepidoptera, 26 Coleoptera, 20 Hemiptera, 1 Hymenoptera, and 1 Orthoptera. Three species of crabs were recorded: hermit crabs, and the blue and red edible crabs.

Table 6. Nocturnal insects recorded from Negril Peninsula.

FAMILY	SCIENTIFIC NAMES	DAFOR RANKING
LEPIDOPTERA- Moths & Buttrflies		
Papilionidae	*Papilio andraemon**	O
Nymphalidae	*Anartia jatrophae*	O
	Heliconius charitonus	O
Pieridae	*Eurema sp.*	O
	Phoebis sannae	O
Hesperidae	*Purgus oleus*	O
Lycaenidae	*Leptotes cassius* (Lucas)	O
Noctuidae	*Utetheisa bella* Dalman	O
	Empyreuma anassa Forbes	R
	Melipotis famelica	R
	Melipotis fasciolaris	R
	Mocis sp.	R
	Cydosia nobilitella (Cramer)	R
Sphingidae	*Manduca sexta jamaicensis* Butler	R
	Pachylia ficus (Linnaeus)	R
	Uk. sp.	R
Geometridae	*Anavitrinella* sp.	F
	Uk. spp. **- 3**	R
Pyralidae	Uk spp. - **18**	R
COLEOPTERA – Beetles		
Curculionidae	*Exophthalmus vittatus*	F
Carabidae	*Calosoma sayi* Dejean	O
	Galerita ruficolis	R
	Aspidoglossa mexicana Chaudoir	F
	Selenophorus chalybeus Dejean	R
	Subfamily Harpalini: Uk. sp.	R
	Apenes lepidula Darlington**	O
	Apenes darlingtoni Ball & Shpeley**	R
	Platynus lewisi Darlington**	R
	Paratachys sp.	R
	Tachys sp.	R
	Uk sp. Subfamily Bembidiini: **- 2**	R
Scarabaeidae	*Cyclocephala tetrica* Burmeister	O
	Subfamily Aphodiinae	D
	Ornicellus sp.	O
Scolytidae	Uk. spp **- 2.**	R
Elateridae	*Conoderus* sp.	R
Lampyridae	*Photinus pallens*	R
Coccinellidae	*Cycloneda sanguinea limbifer* Cay	R
Meloidae	*Alloxacis spinosus* Arnett	F
	Uk. sp.	R
Noteridae	Uk. sp.	D
Staphylinidae	Uk spp. – **3**	D
HYMENOPTERA- Wasps, ants & bees		
Ichneumonidae	Uk sp.	R
ORTHOPTERA- Grasshoppers		
Tettigoniidae	Uk. sp.	R
HEMIPTERA – True bugs		
Reduviidae	*Stenopoda cinerea* Laporte	R
Pyrrhocoridae	*Dysdercus andreae* (Linnaeus)	R
Pentatomidae	Uk. spp. - **3**	R
Rhopalidae	*Jadera aeola* Dallas	R

FAMILY	SCIENTIFIC NAMES	DAFOR RANKING
Cicadellidae	*Hortensia similis* Walker	R
	Uk. spp. - **6**	R
Cicadidae	Uk. sp.	R
Miridae	Uk. sp.	O
Berytidae	Uk. sp.	R
Mesoveliidae	Uk. sp.	R
Corixidae	Uk. sp.	D
Gerridae	Uk. sp.	R
Alydidae	Uk. sp.	R

* = Introduced species.
** = Endemic species

2.2.4. Amphibians, Reptiles and Mammals:

Bats

As is typical for small oceanic islands, Jamaica's mammal fauna is very restricted except for bats, which can disperse across ocean barriers much easier than non-flying animals. The island's extant fauna of native mammals consists of one rodent – the Jamaican Coney (*Geocapromys brownii*) - and 21 bat species. The feeding habits of Jamaican bats range from aerial hunting, gleaning food from vegetation, fish catching and fruit eating to nectar feeding.

During the day, most bats in Jamaica roost in caves or anthropogenic equivalents (e.g. roofs). Over 1000 caves, caverns and large sinkholes have been identified and mapped on the island (Jamaican Cave Register: http://www.jamaicancaves.org/register.html). Small colonies of roosting bats have been observed in many of these structures, and some of the larger ones have enormous colonies consisting of several 10,000 individuals.

The Jamaican Cave Register does not contain any caves within the study area. However, along the rocky cliffs representing fossil sea shores, the survey revealed a number of rock crevices and chambers large enough for small bat colonies. The largest structure was a cavern about 8 m deep, 6 m wide, and 6-8 m high. According to local sources, a Kumina congregation used to worship in it until the 1960's. On a day visit during the survey, 19 small-sized bats could be seen roosting in the roof of the cavern. Among the smaller structures, only two revealed bats – one individual in each case. Small-sized bats hunting insects in the air were observed across all open areas of the study site during the night of May 29/30. However, none were observed during the following night. Given the small number of roosting bats and the irregular use of the site for foraging, no attempts were made to capture and identify specimens.

Amphibians

Three amphibian species were recorded in the study site: the endemic *Osteopilus brunneus* (Laughing Frog), and the two introduced *Bufo marinus* (Cane Toad, "Bullfrog") and *Eleutherodactylus johnstonei*. ***Osteopilus brunneus*** is one of four endemic hylid frog species. All four animals are closely associated with large bromeliads (tank bromeliads; "wild pines") that serve as aquatic microhabitats for the tadpoles. *O.*

brunneus is very common throughout the island where tank bromeliads occur. Within the study sites, these plants grew frequently on large trees, but rarely on the ground, in the degraded forest and the ruinate. Also, they occurred on some of the isolated large trees in pasture areas. The characteristic call of *O. brunneus* was heard commonly wherever tank bromeliads were located. ***Bufo marinus*** is a large toad that was introduced to Jamaica in the 19th century, allegedly as a pest control agent. It has spread across the entire island and is extremely successful in most terrestrial ecosystems. The toad was observed numerous times in all habitats of the study area. Also, choruses of breeding males were heard repeatedly. ***Eleutherdactylus johnstonei*** is a member of the most diverse frog genus in the Caribbean islands, and one of two introduced *Eleutherodactylus* species in Jamaica. It is the most common amphibian in the island's anthropogenic environments; however, it is absent in forested areas. The 19 endemic Eleutherodactylus species are most diverse in wet forests. Within the study site, many *E. johnstonei* were heard in the pastures and some patches within the ruinate of the northeastern section.

Nocturnal Reptiles

Two nocturnal reptiles were observed in the study area, the gecko *Aristelliger praesignis* (Croaking Lizard), and *Epicrates subflavus* (Yellow Snake, Jamaican Boa). ***Aristelliger praesignis*** is restricted to Jamaica and the Cayman Islands. In Jamaica, it occurs in large numbers in diverse habitats from natural forests to human settlements. Despite its harmless nature, it is greatly feared by many Jamaicans. The species was heard croaking and was seen throughout the study area. ***Epicrates subflavus*** is endemic to Jamaica and the island's largest snake. Specimens of up to 3 m length have been reported, though usually encountered animals are much smaller. The snake occupies a wide range of habitats including both forests and anthropogenic environments. While found island wide, the snake is most frequently reported from Portland Ridge, Cockpit Country, and western Westmoreland. The snake is considered vulnerable to extinction by IUCN (International Union for the Conservation of Nature), and is protected under Jamaica's Wildlife Act. Habitat destruction and degradation, persecution by man due to unjustified fear, and predation by exotic animals are major conservation concerns.

A male Jamaican Boa was encountered during the night survey on May 29, 2007. It measured approximately 6 feet in length. It appeared healthy, alert and well nourished. This site forms an integral part of a much larger area supporting the Jamaican Boa.

2.3 ASSESSMENT OF IMPACTS

2.3.1 Methodology for Assessing Expected Impacts

Impacts are semi-quantitatively and quantitatively assessed according to the six criteria, which are defined below. The objectives of defining the terms and criteria for impact assessment are to enable application of a robust methodology that is a) Reproducible in that it can be tested and repeated by EIA reviewers so that they can conduct independent determinations, which are directly comparable b) More valid in that it allows for a comprehensive assessment of the impact, as opposed to a simplistic identification of environmental impacts likely to arise from the

project. The ten criteria are as follows:

1. Scale: this refers to the magnitude of the adverse effect in terms of the geographic extent of influence arising from frequency and magnitude of the causative action. This allows higher assessment of impacts with a wider sphere of influence.

2. Affected Numbers: this considers the numbers of individuals (organisms, people etc.) From a valued population that stand to be impacted. This parameter can refer to indicator species or general receptor populations.

3. Secondary Effects: This parameter looks at the impact as a trigger mechanism for other effects, particularly those manifesting downstream of a pathway emanating from a project component. Latent effects that could occur in the future, such as bioaccumulation of heavy metals in the food chain, or effects on future generations.

4. Persistence: This addresses the frequency and duration of effects in the environment.

In general, persistent (long-term) or frequently adverse effects are regarded as more significant.

5. Reversibility. This criterion evaluates the extent to which an effected receptor can be returned to its pre-project state (reversibility).

6. Extent Mitigable: This addresses the ease to which feasible measures can be implemented to prevent or reduce the environmental cost. It should consider the economic cost of implementing these measures, and whether there are any moderating circumstances or benefits that need to be considered given the environmental cost. The extent to which appropriate and cost effective measures can be implemented to mitigate the effects.

Table showing Pre-set Impact Assessment Criteria for Negative Impacts

	1	2	3
CRITERIA	MINOR	MODERATE	SIGNIFICANT
1.SCALE	Isolated effects within project site. .	Localized area close to borders or offsite dispersion pathways	Widespread: offsite regional effects.
2.AFFECTED NUMBERS	Less than 1% population or habitat area is directly exposed.	1% to 10% population or habitat directly exposed.	More than 10% population or habitat area is directly exposed.
3.SECONDARY EFFECTS	Few Indirect effects	Many indirect negative affects. One trophic level within one generation affected.	Many indirect negative affects. More than 1 generation affected. Several trophic levels involved.
4.RESILIENCE	Receptors are resilient. Nuisance but no real loss of revenue or amenity. Impact does not occur at a time when receptors are vulnerable	Morbidity or health concern. Temporary loss of revenue or amenity. Impact occurs at the start or end of a period when receptor is particularly vulnerable.	Receptors unable to cope. Mortality or trauma in populations. Loss of revenue or amenity is sustained after remedial action is taken. Impact occurs at the peak time when receptor is vulnerable.
5.PERSISTENCE	Lasting less than a few months before recovery occurs with no observable residual effects. Related to duration of event.	Lasting from a few months to two years before signs of recovery.	Impact persistent after 2 years. Impacts on a biological population over a number of recruitment cycles.
6.REVERSIBILITY	Can be returned to original state completely with removal of structural elements	Can be returned to a productive state with removal or change of use of structural elements.	Cannot be easily or cost-effectively returned to previous state or be re-used for any other productive purpose.
7.EXTENT MITIGABLE	Very easily and cost-effectively mitigated. Significant opportunities For environmental enhancement or benefits in the short to medium term (arising within a few months).	Cost-effectively mitigated. Long term environmental benefit as a result of the short-term negative impact associated with project (arising within 2 years)	Cannot be easily mitigated or requires major design change to causative activities.No mitigation possible. No opportunity for environmental enhancement or no perceptible environmental benefit.

2.3.2 Expected Impacts

Both positive and negative project impacts were identified using the following methods:

1. Technical inputs from environmental specialists on the EIA team.
2. Review of the possible impact-causing aspects of the project.
3. Review of impact assessments done for similar projects.
4. Regulatory criteria governing aspects of the environment likely to be impacted.
5. Review of the risks arising from the project and the range of environmental consequences that could arise under upset conditions.

The following environmental impacts have the potential to affect the Terrestrial Ecology during implementation of this project. These are categorized according to the resources being impacted. They are separated into Negative and Positive impacts. The negative impacts are a direct result of the development while the positive impacts are a result of

PLANNED ACTIONS recommended by the EIA and taken by the developers PRIOR to site clearance, during pre-construction and operational phase.

LIST OF EXPECTED NEGATIVE IMPACTS to Terrestrial Ecology

	EXPECTED NEGATIVE IMPACTS TO TERRESTRIAL ECOLOGY
1	Vegetation Clearance for project footprint
2	Adjustments in Plant Community Structure
3	Potential Fragmentation and Loss of Habitat
4	Potential Disturbance of Sensitive Species
5	Introduction of Ecological Barriers

Expected Negative Impact1: Vegetation Clearance for Project Footprint

Causative Action: Site Clearance

CRITERIA	**ASSESSMENT**	**SCORE**
1.SCALE	On site. Even though site is 361 acres, less than 220 acres will be cleared (of what has been classified as 38% pasture , 28% ruinate and 17% disturbed forests) but that clearance will have effects on the wider ecosystem.	2
2.AFFECTED NUMBERS	More than 10% of the habitat area is exposed.	3
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	3
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	A few months to 2 years before signs of recovery	2
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION:	**MODERATE**	**2**

Expected Negative Impact 2: Adjustments in Plant Community Structure

Causative Action: Site clearance

CRITERIA	ASSESSMENT	SCORE
1.SCALE	On site. Even though site is 361 acres ,less than 220 acres will be cleared (of what has been classified as 38% pasture , 28% ruinate and 17% disturbed forests) but that clearance will have effects on the wider ecosystem	1
2.AFFECTED NUMBERS	The degraded coastal plains which lack plant diversity will be most affected will not be affected since they will be UNTOUCHED.	1
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MINOR**	**1**

Expected Negative Impact 3: Potential Fragmentation and Loss of habitat

Causative Action: Site Clearance and Construction of Buildings

CRITERIA	**ASSESSMENT**	**SCORE**
1.SCALE	Limited to site.	**1**
2.AFFECTED NUMBERS	The most complex and intact habitats along the cliff face and the buffer areas adjacent to cliff face will be left intact. Between 1% and 10% of population is exposed	**2**
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	**2**

Expected Negative Impact 4: Potential Disturbance of Sensitive Species

Causative Action: **Site Clearance, Construction and Operation**

CRITERIA	ASSESSMENT	SCORE
1.SCALE	Limited to site and	1
2.AFFECTED NUMBERS	The most complex and intact habitats along the cliff face and the buffer areas adjacent to cliff face will be left intact. Between 1% and 10% of population is exposed	1
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	**2**

Expected Negative Impact 5: Introduction of Ecological barriers

Causative Action: Construction of multi-storey buildings, roads etc

CRITERIA	ASSESSMENT	**SCORE**
1.SCALE	Limited to site and taking place on less than 220 acres of the 361 acres	
2.AFFECTED NUMBERS	The most complex and intact habitats along the cliff face and the buffer areas adjacent to cliff face will be left intact. Between 1% and 10% of population is exposed	1
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1

6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	**2**

LIST OF EXPECTED POSITIVE IMPACTS to Terrestrial Ecology

	POSITIVE IMPACTS OF PLANNED ACTIONS TO TERRESTRIAL ECOLOGY
1	Creation of a Conservation Area on the Upper Shelf as well as other pockets of habitat with large trees on coastal plain.
2	Pre-clearance removal of sensitive and endangered plant species to conservation area and re-integration of wild species into landscaping of green spaces
3	Preservation of the entire Limestone Cliff face, Escarpment Shelf and area adjacent to cave mouth as.
4	Faunal Collection/Rescue and release mechanism developed for pre-construction, construction and operational phase.

EXPECTED POSITIVE IMPACT 1: Creation of a Conservation Area on the Upper Shelf as well as other pockets of habitat with large trees on coastal plain.

CRITERIA	ASSESSMENT	SCORE
1.SCALE	Limited to site	1
2.AFFECTED NUMBERS	The most complex and intact habitats along the cliff face and the buffer areas adjacent to cliff face will be left intact. Between 1% and 10% of population is exposed	1
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	**2**

EXPECTED POSITIVE IMPACT 2:Pre-clearance removal of sensitive and endangered plant species to conservation area and re-integration of wild species into landscaping of green spaces

CRITERIA	ASSESSMENT	SCORE
1.SCALE	Les than 250 acres	1
2.AFFECTED NUMBERS	The degraded coastal plains which lack plant diversity will be most affected	1
3.SECONDARY EFFECTS	Habitat loss and many indirect negative effects for more than 1 generation and several trophic levels.	2
4.RESILIENCE	Receptors are resilient	1
5.PERSISTENCE	Less than a few months	1
6.REVERSIBILITY	Can be returned to a productive state	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	**2**

EXPECTED POSITIVE IMPACT 3: Preservation of the entire Limestone Cliff face (with a buffer), Escarpment Shelf and area adjacent to cave mouth as.

CRITERIA	ASSESSMENT	SCORE
1.SCALE	Within project site	1
2.AFFECTED NUMBERS	More than 10% of the population	2
3.SECONDARY EFFECTS	Many indirect positive effects. One trophic level within one generation affected.	3
4.RESILIENCE	Availability of an extensive spatial habitat alternative to a wide cross section of vertebrate and invertebrate and birds for 1 generation and several trophic levels.	1
5.PERSISTENCE	Receptors are resilient	2
6.REVERSIBILITY	Can be returned to a productive state in Less than a few months	2
7.EXTENT MITIGABLE	Cost effectively mitigated. Long term environmental benefits arising within 2 years.	2
CLASSIFICATION	**MODERATE**	2

EXPECTED POSITIVE IMPACT 4: Faunal Collection/Rescue and release mechanism developed for pre-construction, construction and operational phase.

CRITERIA	ASSESSMENT	SCORE
1.SCALE	Limited to site	1
2.AFFECTED NUMBERS	More than 10% population or habitat area is exposed	3
3.SECONDARY EFFECTS	Many indirect effects. One tropic level within one generation affected.	2
4.RESILIENCE	Mortality or trauma in populations	3
5.PERSISTENCE	A few months to recovery	1
6.REVERSIBILITY	Can be returned to original state with removal into intact habitat	1
7.EXTENT MITIGABLE	Cost effectively mitigated.	3
CLASSIFICATION	**Moderate**	**2**

The foregoing found a total of 5 site clearance related negative impacts to the areas Terrestrial Ecology and 4 site clearance related positive impacts to the areas Terrestrial ecology. The highest ranked Negative Impact was related to Introduction **of Ecological barriers, Potential Disturbance of Sensitive Species and Potential Fragmentation and Loss of habitat which were all classified as MODERATE.**

2. 4 Mitigating Measures for Floristic Communities

2.4.1 In-situ Conservation

It is being recommended that the entire contiguous limestone cliff within the project site, along with a significant buffer area north and south of the cliffs be left intact to support

in-situ conservation efforts and create a likely scenario that both critically threatened species **Agave oberlii and Zamia amblyphylllidia** and possibly others will not risk being lost.

Leaving this entire area intact will have the two-fold benefit of eliminating the risks involved with transplanting plant specimen as well as providing adequate roosting and feeding area for the bird population resident in the area. Additionally a few 1 acre patches of vegetation (approximately 1 acre each in size) be left intact within the Upper Shelf.

The second area being suggested is on the upper shelf and is represented by patches of Forest typified by:
a) Dry Limestone tree associations (Red Birch, Dogwood etc) giving rise to a continuous canopy and a highly developed under-story.
B) Dry limestone forests dominated by a profusion of both terrestrial and epiphytic bromeliads, orchids, agaves and cacti. This is one area where Agave oberlii was observed.

These areas once left intact can also serve as a repository for ex-situ conservation of some of the coastal plain specimen. This area is to be properly demarcated by the conventionally accepted means and appropriate signage should be displayed to inform all Construction staff of this area and its value.

2.4.2 Ex-situ Conservation

Removal and relocation of certain plant families on the coastal plains and along the bare limestone pavement PRIOR to site clearance is being recommended. This will in some way also impact on the temporal and spatial range of associated insect pollinators towards the areas that are to be left intact on the Upper Shelf. Two types of ex-situ conservation initiatives are being proposed for this site.

The first involves the removal and relocation of valuable bromeliads, orchids, agaves and cacti from the coastal plains to the cliff face and buffer areas adjacent to the cliffs OR to the Upper shelf depending on which location best mimics the set of conditions the plants were removed from.

The second will guard against loss of species by ensuring that duplicates of each specimen that are removed from the coastal basin and relocated to the main plateau will also be taken to the Dolphin Head Live Botanical Museum where they will be established under close daily supervision. Even though that area is markedly higher and wetter than the Negril Peninsula , the long dry season and the limestone substrate should mimic the environment enough to facilitate survival. It is being recommended that this initiative be done through a partnership with the Institute of Jamaica; Specialists from the University of the West Indies and the Dolphin Head Trust to ensure proper documentation of specimen that are relocated up to the Dolphin Head Forest Reserve. NEPA should be advised of the time of relocation so that a representative could be present to observe the works.

2.5 Mitigating Measures for Faunal and Avi-faunal Communities

The vegetation on both the Coastal basin and the lower shelf is already degraded through various site clearances over the years. It is however home to quite an assemblage of vertebrate and invertebrate organisms. The site contains no unique habitat features; its habitat types are well represented within the wider area of southwestern Westmoreland. The best remaining forests of this area occur to the east and west of the study site, according to the land use assessment of the Forestry Department. Except for the Jamaican Boa, the nocturnal vertebrates of the site are common species occurring throughout most of Jamaica; also, these species are quite resistant to habitat alteration and not threatened by extinction. No significant bat roosts occur within the site.

It is recommended that larger trees be tagged for non-removal (size as well as status as a known feeding tree is the basis of tagging) which will also assist in softening the impact of habitat loss during site clearance. Where possible the developers are being recommended to leave small stands of trees to allow for the creation of microhabitats to carry out ecosystem services (such as provision of organic matter, leaf litter , decomposition and root exudates)as well as providing nest and food for displaced avi-fauna and other vertebrae and invertebrae species. These small artificially created habitats will go a long way in minimizing the large scale loss of habitiat, normally associated with developments of this magnitude. Where this cannot be done , replanting of limestone forest tree associations (inclusive of bird feeding trees) are recommended to encourage the re-colonization of the area with some of the original faunal and avi-faunal dwellers. The use of Tank Bromeliads as a landscaping specimen throughout the site is to be encouraged since it is home to numerous frogs.
The areas on the Upper Shelf that are recommended for in-situ and ex-situ conservation will also play a significant role in the provision of alternative habitat during pre- and post site clearance. The caves on –site should be allowed a small buffer area of natural undisturbed vegetation around the mouth to facilitate the survival of cave dwelling organisms that typically have a spatial range of many miles.

2.6 Recommendations for Conservation of the Jamaican Boa

The continued survival of the Jamaica Boa is a major conservation task. The Jamaican Boa is the only vertebrate species within the site that is recognized as threatened. The site forms an integral part of a much larger area in Westmoreland that is known to support the snake. No invertebrate species were identified which merit special conservation consideration. While forests are the original habitat of the snake, it is also able to survive in anthropogenic landscapes if persecution by exotic predators and man can be controlled. Prior to and during the Site Clearance and Construction phase, the labour and construction staff can be briefed regarding sitings of the Jamaican Boa and any other animals. They can be instructed to place these animals in the Conservation Areas which encompasses the entire length of cliffs along the site as well as the few pockets of intact Conservation areas to be left on the Upper Shelf. They should also be briefed to alert the relevant agencies regarding their find. With southwestern Westmoreland being a center of the snake's distribution, the Negril resort sector should proactively support the snake population. Feeding on a variety of vertebrate animals, the Jamaican Boa is a top predator in Jamaica's ecosystems. A complex landscape

promoting a diverse vertebrate community will be attractive both for the human inhabitants as well as the snake. The following specific recommendations are made:

- Avoid indiscriminate application of pesticides that may harm local wildlife
- Promote survival of Jamaican Boa and other wildlife within developed resort by
    - Conserving sections of forest within the site, particularly along the rocky cliffs
    - Preserving physical integrity of the cliffs
    - Promoting ornamental plants – both native and introduced - that encourage native wildlife, both vertebrate and invertebrates such as butterflies.
    - Controlling exotic predators, particularly cats and dogs
    - Educating residents and guests to appreciate wildlife
- Monitor survival of Jamaican Boa after resort construction

2.7 Conclusion

While there is no question that developments of this magnitude will destroy flora and habitats for fauna, it is believed that unfortunate lessons learnt from other coastal developments will assist in making the developers and this development a little more sensitive to potential impacts and actually listen to the recommendations put forward where conservation areas are concerned. There are many who will insist that this approach may not be successful, however

The focus on identification and removal/relocation of important, threatened and rare plant species to both on-site and off-site conservation areas is an initiative which will be the first of its kind in the island and can be carried out in partnership with agencies like the Institute of Jamaica, The University of the West Indies and the Dolphin Head Trust Environmental NGO based in Hanover, the Parish adjacent to Westmoreland. It is believed that the survival rate of plants removed during this initiative will be high due to the naturalness of the areas that the plants are being relocated to. Once executed, this model for developer /ENGO partnership for conservation of sensitive habitats and sensitive species , can be duplicated and taken one step further to include monitoring during the pre- construction and construction phase.

Dr Eric Garraway and Dr.Peter Vogel's Report

Methods

Nocturnal surveys were conducted in the nights of May 28/29, and May 29/30, 2007. Areas to visit in the night were identified in the day. Also, during these day visits, major habitat types were identified. These types were later mapped with the help of satellite imagery obtained from GoogleEarth. A multitude of roads and footpaths allowed easy access to most sections of the study site. All habitat types were assessed by walking along these conduits. Nocturnal vertebrates were identified by their calls and by sight.

The major nocturnal invertebrate survey was carried out using a light traps; in addition some species were identified by sight. Light traps, equipped with 120W MV lamps, were deployed within or adjacent to all the major habitat types. Collection began at dusk (6:30) pm and concluded at dawn (6:00 am). The material was taken to the laboratory for analysis. The Invertebrate Collection at the University of the West Indies, and available literature was used in the identification of the species.

Habitat Types

Most of Jamaica was once covered in forest, but much of it is now converted or heavily degraded. The Forestry Department (FD) has carried out the most recent and island wide mapping of land use in 1990. Only two sections of southwestern Westmoreland, the wider area including the study site, are classified as proper forest (Fig. 1). Two of FD's land use categories cover the study site (Fig. 2):

- Fields: anthropogenic herbaceous communities that may include scattered scrub and trees
- Mixture of disturbed forest (51-75%) and fields (26-50%): fragmented and degraded woodland, interspersed by open areas.

For the purpose of the present study, the following habitat types are distinguished (Fig. 3, 4):

- Disturbed Forest (16.9% of total site area)
- Ruinate (28.0%)
- Pasture (37.8%)
- Coastal Scrub (15.6%)
- Shore Woodland (1.7%)

No natural forest has remained within the study site. Areas with continuous soil cover have all been converted to pasture, and wooded vegetation is mainly restricted to rocky substrates. Some of the best maintained forest features occur along the steep rocky cliffs (Fig. 6).

The Nocturnal Vertebrate Fauna

Three species of Amphibians, 2 species of Reptiles, 4 species of birds and 1 species of bat were recorded from the study site**.**

Amphibians

Three amphibian species were recorded in the study site: the endemic *Osteopilus brunneus* (Laughing Frog), and the two introduced *Bufo marinus* (Cane Toad, "Bullfrog") and *Eleutherodactylus johnstonei*.

Osteopilus brunneus is one of four endemic hylid frog species. All four animals are closely associated with large bromeliads (tank bromeliads; "wild pines") that serve as aquatic microhabitats for the tadpoles. *O. brunneus* is very common throughout the island where tank bromeliads occur. Within the study sites, these plants grew frequently on large trees, but rarely on the ground, in the degraded forest and the ruinate. Also, they occurred on some of the isolated large trees in pasture areas. The characteristic call of *O. brunneus* was heard commonly wherever tank bromeliads were located.

Bufo marinus is a large toad that was introduced to Jamaica in the 19th century, allegedly as a pest control agent. It has spread across the entire island and is extremely successful in most terrestrial ecosystems. The toad was observed numerous times in all habitats of the study area. Also, choruses of breeding males were heard repeatedly.

Eleutherdactylus johnstonei is a member of the most diverse frog genus in the Caribbean islands, and one of two introduced *Eleutherodactylus* species in Jamaica. It is the most common amphibian in the island's anthropogenic environments; however, it is absent in forested areas. The 19 endemic Eleutherodactylus species are most diverse in wet forests. Within the study site, many *E. johnstonei* were heard in the pastures and some patches within the ruinate of the northeastern section.

Nocturnal Reptiles

Two nocturnal reptiles were observed in the study area, the gecko *Aristelliger praesignis* (Croaking Lizard), and *Epicrates subflavus* (Yellow Snake, Jamaican Boa).

Aristelliger praesignis is restricted to Jamaica and the Cayman Islands. In Jamaica, it occurs in large numbers in diverse habitats from natural forests to human settlements. Despite its harmless nature, it is greatly feared by many Jamaicans. The species was heard croaking and was seen throughout the study area.

Epicrates subflavus is endemic to Jamaica and the island's largest snake. Specimens of up to 3 m length have been reported, though usually encountered animals are much smaller. The snake occupies a wide range of habitats including both forests and anthropogenic environments. While found island wide, the snake is most frequently reported from Portland Ridge, Cockpit Country, and western Westmoreland. The snake is

considered vulnerable to extinction by IUCN (International Union for the Conservation of Nature), and is protected under Jamaica's Wildlife Act. Habitat destruction and degradation, persecution by man due to unjustified fear, and predation by exotic animals are major conservation concerns.

A male Jamaican Boa was encountered during the night survey on May 29, 2007. It measured approximately 6 feet in length. It appeared healthy, alert and well nourished. The location of the encounter is shown below.

Persons living and/or working in the vicinity of the study site were well aware of the presence of the species, and several claimed to have come across snakes repeatedly.

Nocturnal Birds

Four species of nocturnal birds could be confirmed within the study site during the night survey: Yellow-crowned Night Heron, Northern Potoo, Common Barn Owl and Jamaican Owl. None of these species is considered threatened by IUCN.

The **Yellow-crowned Night Heron** (*Nycticorax violaceus*) is a common resident on beaches and in wetlands (Downer and Sutton 1990). Two individuals were observed in the day roosting on trees along the shore of the study site. They were not observed in the night. The probably had left the roosting area to forage elsewhere, since the rocky shoreline of the site does not provide suitable feeding grounds. When flooded after heavy rains, the flat pasture along the shoreline might be visited by foraging night herons.

The **Northern Potoo** (Nyctibius *jamaicensis*) belongs to a small family of nocturnal birds in tropical America. In Jamaica, it is a locally common resident in woodlands, and along wooded areas bordered by open clearings with scattered trees (Downer and Sutton 1990). During the night survey, the distinctive voice of two Potoos were heard, one along the pasture on the edge of the ruinate, and the other in the disturbed forest.

The **Common Barn Owl** (*Tyto alba*) has a worldwide distribution. In Jamaica, it is a common bird of open or partly-open areas from sea level to the mountains (Downer and Sutton 1990). During the night survey, the owl was heard and seen often in all pasture areas.

The **Jamaican Owl** (*Pseudoscops grammicus*) represents a genus and species that is endemic to Jamaica. It is widespread at all elevations in forests, but also can occur in open spaces with isolated trees (Downer and Sutton 1990). During the night survey, at least 6 different individuals were heard in the ruinate and the disturbed forest.

Bats

As is typical for small oceanic islands, Jamaica's mammal fauna is very restricted except for bats, which can disperse across ocean barriers much easier than non-flying animals. The island's extant fauna of native mammals consists of one rodent – the Jamaican Coney (*Geocapromys brownii*) - and 21 bat species. Feeding habits of Jamaican bats range from aerial hunting, gleaning food from vegetation, fish catching and fruit eating to nectar feeding.

During the day, most bats in Jamaica roost in caves or anthropogenic equivalents (e.g. roofs). Over 1000 caves, caverns and large sinkholes have been identified and mapped on the island (Jamaican Cave Register: http://www.jamaicancaves.org/register.html). Small colonies of roosting bats have been observed in many of these structures, and some of the larger ones have enormous colonies consisting of several 10,000 individuals.

The Jamaican Cave Register does not contain any caves within the study area. However, along the rocky cliffs representing fossil sea shores, the survey revealed a number of rock crevices and chambers large enough for small bat colonies. The largest structure was a cavern about 8 m deep, 6 m wide, and 6-8 m high. According to local sources, a Kumina congregation used to worship in it until the 1960's. On a day visit during the survey, 19 small-sized bats could be seen roosting in the roof of the cavern. Among the smaller structures, only two revealed bats – one individual in each case.

Small-sized bats hunting insects in the air were observed across all open areas of the study site during the night of May 29/30. However, none were observed during the following night.

Given the small number of roosting bats and the irregular use of the site for foraging, no attempts were made to capture and identify specimens.

Exotic mammals

Free-roaming goats were observed in the rocky cliffs during the day. A few rats were observed during the nocturnal survey. Pastures showed signs of recent use by cattle, however, no cattle were present during the assessment period. Sightings of cats and dogs were restricted to the settlements along the periphery of the study area.

The Nocturnal Invertebrate Fauna

Eighty six species of insects were identified; 31 species of Lepidoptera, 26 Coleoptera, 20 Hemiptera, 1 Hymenoptera, and 1 Orthoptera. Three species of crabs were recorded.

Order Lepidoptera

Thirty one species of Lepidoptera were noted. Seven species of butterflies were recorded at dusk or at dawn; these are not nocturnal but very late or early fliers. All the species recorded occur in a wide variety of habitats across Jamaica.
The moths were dominated by members of the Family Pyralidae, 18 species. However keys for the Jamaican Pyralids are not available and many were not identified to species. Members of this family are often generalist in their food preferences and some members have been know to extend their range to economically important plants.

Order Coleoptera

The Coleopteran species were dominated by members of the family Carabidae. Carabids are generally nocturnal predators. feeding on other insects. The number of Carabids species was unusually high. Three species are endemic to Jamaica, while one species is unidentified; this species was not recorded in the recent review of the Jamaican Carabidae (Hamilton 2006). The other species of Carabids collected here have wide distribution (Hamilton 2006)

The Scarabidae and Stapyylinidae recorded here are associated with cattle dung and these occurred in very large numbers.

Order Hemiptera

The Hemiptera were species generally associated with grass; the specimens in the museum collections indicate a very wide distribution across Jamaica. A single species from the Family Corixidae was collected in very high numbers; these are aquatic and were observed in many small pools in the limestone rock.

Crabs

Three species of crabs were recorded; hermit crabs, and the blue and red edible crabs, all with very wide distribution across Jamaica.

Table 1. Nocturnal insects recorded from Negril Peninsula.

Uk.sp. = unidentified species.
More than one unidentified species indicated as: Uk. spp. followed by a number.
sp. = genus known but species unknown
* = Introduced species.
** = Endemic species

FAMILY	SCIENTIFIC NAMES	DAFOR RANKING
LEPIDOPTERA- Moths & Buttrflies		
Papilionidae	*Papilio andraemon**	O
Nymphalidae	*Anartia jatrophae*	O
	Heliconius charitonus	O
Pieridae	*Eurema sp.*	O
	Phoebis sannae	O
Hesperidae	*Purgus oleus*	O
Lycaenidae	*Leptotes cassius* (Lucas)	O
Noctuidae	*Utetheisa bella* Dalman	O
	Empyreuma anassa Forbes	R
	Melipotis famelica	R
	Melipotis fasciolaris	R
	Mocis sp.	R
	Cydosia nobilitella (Cramer)	R
Sphingidae	*Manduca sexta jamaicensis* Butler	R
	Pachylia ficus (Linnaeus)	R
	Uk. sp.	R
Geometridae	*Anavitrinella* sp.	F
	Uk. spp. **- 3**	R
Pyralidae	Uk spp. - **18**	R
COLEOPTERA – Beetles		
Curculionidae	*Exophthalmus vittatus*	F
Carabidae	*Calosoma sayi* Dejean	O
	Galerita ruficolis	R
	Aspidoglossa mexicana Chaudoir	F
	Selenophorus chalybeus Dejean	R
	Subfamily Harpalini: Uk. sp.	R
	Apenes lepidula Darlington**	O
	Apenes darlingtoni Ball & Shpeley**	R
	Platynus lewisi Darlington**	R
	Paratachys sp.	R
	Tachys sp.	R
	Uk sp. Subfamily Bembidiini: **- 2**	R
Scarabaeidae	*Cyclocephala tetrica* Burmeister	O
	Subfamily Aphodiinae	D
	Ornicellus sp.	O

FAMILY	SCIENTIFIC NAMES	DAFOR RANKING
Scolytidae	Uk. spp - **2.**	R
Elateridae	*Conoderus* sp.	R
Lampyridae	*Photinus pallens*	R
Coccinellidae	*Cycloneda sanguinea limbifer* Cay	R
Meloidae	*Alloxacis spinosus* Arnett	F
	Uk. sp.	R
Noteridae	Uk. sp.	D
Staphylinidae	Uk spp. – **3**	D
HYMENOPTERA- Wasps, ants & bees		
Ichneumonidae	Uk sp.	R
ORTHOPTERA- Grasshoppers		
Tettigoniidae	Uk. sp.	R
HEMIPTERA – True bugs		
Reduviidae	*Stenopoda cinerea* Laporte	R
Pyrrhocoridae	*Dysdercus andreae* (Linnaeus)	R
Pentatomidae	Uk. spp. - **3**	R
Rhopalidae	*Jadera aeola* Dallas	R
Cicadellidae	*Hortensia similis* Walker	R
	Uk. spp. - **6**	R
Cicadidae	Uk. sp.	R
Miridae	Uk. sp.	O
Berytidae	Uk. sp.	R
Mesoveliidae	Uk. sp.	R
Corixidae	Uk. sp.	D
Gerridae	Uk. sp.	R
Alydidae	Uk. sp.	R

General comments on the nocturnal invertebrate fauna

Most species occur in very low numbers, often 1-3 specimens recorded. This is the norm for tropical ecosystems. The species that occurred in abundance were generally associated with the cattle dung which was common throughout the pastures. One species of Corixid was also abundant in the rock pools which occurred in the limestone cavities.

Several of the species were not identified below the level of Family or Subfamily. This is the result of the fact that very little is known of many groups of Jamaican invertebrate fauna. It is therefore not possible to say what their status is at this time. However, the fauna generally resemble what is expected in a mixture of pasture and patches of highly disturbed forests.

Conclusions

The vegetation of the study site has been heavily altered by human activities. All habitats show intrusions of exotic species. Flat areas with continuous soil layer have been converted to pasture, with some coastal section turning into secondary. Both pasture and secondary scrub are dominated by exotic species. Degraded remnants of natural forest have remained on rocky substrates, particularly along the steep cliffs. A large section of the area is covered by ruinate vegetation with a heterogeneous mixture of native and exotic species; relatively few large trees; and dense, scrubby undergrowth.

The site contains no unique habitat features; its habitat types are well represented within the wider area of southwestern Westmoreland. The best remaining forests of this area occur to the east and west of the study site, according to the land use assessment of the Forestry Department.

Except for the Jamaican Boa, the nocturnal vertebrates of the site are common species occurring throughout most of Jamaica; also, these species are quite resistant to habitat alteration and not threatened by extinction. No significant bat roosts occur within the site.

The Jamaican Boa is the only vertebrate species within the site that is recognized as threatened. The site forms an integral part of a much larger area in Westmoreland that is known to support the snake.

No invertebrate species were identified which merit special conservation consideration

Recommendations

The continued survival of the Jamaica Boa is a major conservation task. While forests are the original habitat of the snake, it is also able to survive in anthropogenic landscapes if persecution by exotic predators and man can be controlled. With southwestern Westmoreland being a center of the snake's distribution, the Negril resort sector should proactively support the snake population. Feeding on a variety of vertebrate animals, the Jamaican Boa is a top predator in Jamaica's ecosystems. A complex landscape promoting a diverse vertebrate community will be attractive both for the human inhabitants as well as the snake. The following specific recommendations are made:

- Before clearing for construction, transfer rare and valuable plant species (e.g. agaves, orchids, tank bromeliads) to a nursery; redistribute for ornamental use after project is completed
- Use similar approach for Jamaican Boa
- Avoid indiscriminate application of pesticides that may harm local wildlife

- Promote survival of Jamaican Boa and other wildlife within developed resort by
    - Conserving sections of forest within the site, particularly along the rocky cliffs
    - Preserving physical integrity of the cliffs
    - Promoting ornamental plants – both native and introduced - that encourage native wildlife, both vertebrate and invertebrates such as butterflies.
    - Controlling exotic predators, particularly cats and dogs
    - Educating residents and guests to appreciate wildlife
- Monitor survival of Jamaican Boa after resort construction
- Promote the use of tank bromeliads as ornamental plants to promote frog diversity.

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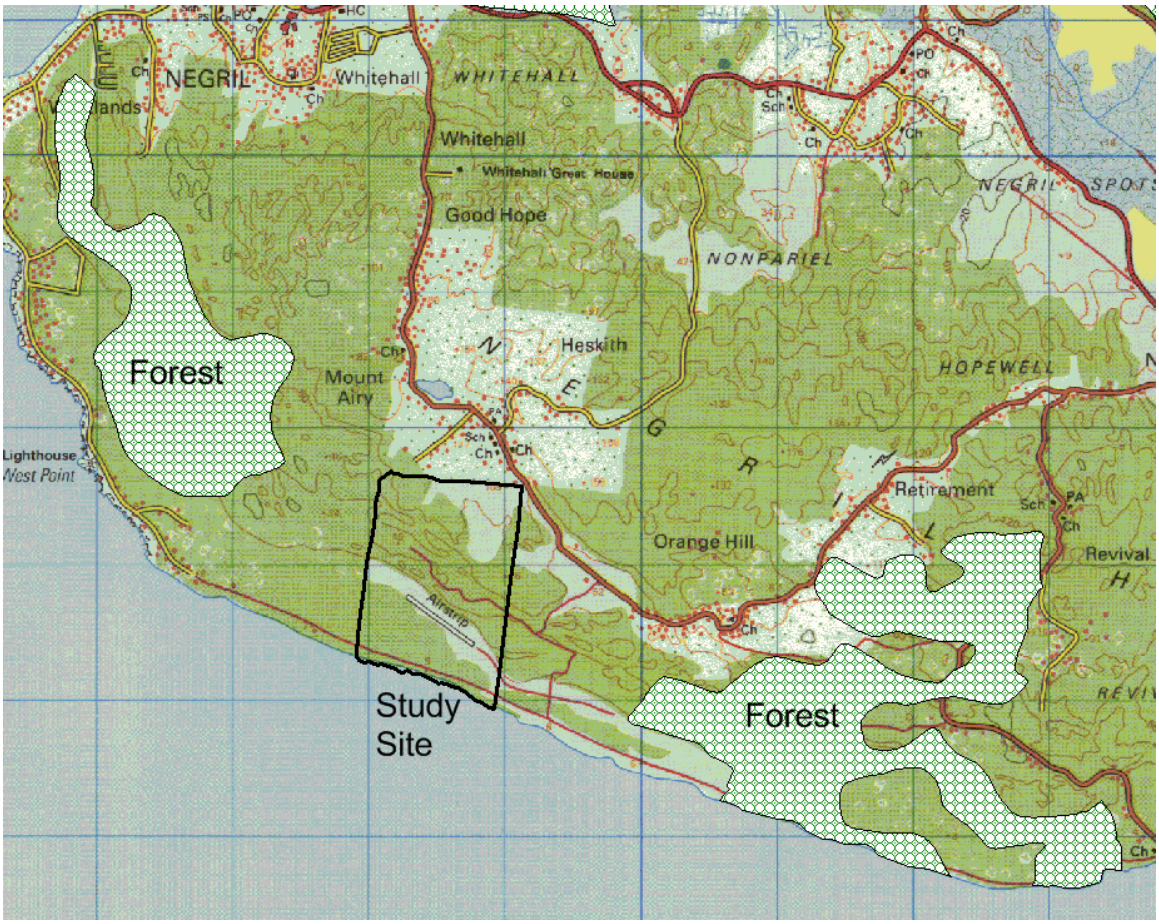


Fig. 1. Forest areas in southwestern Westmoreland according to the land use assessment of the Forestry Department.

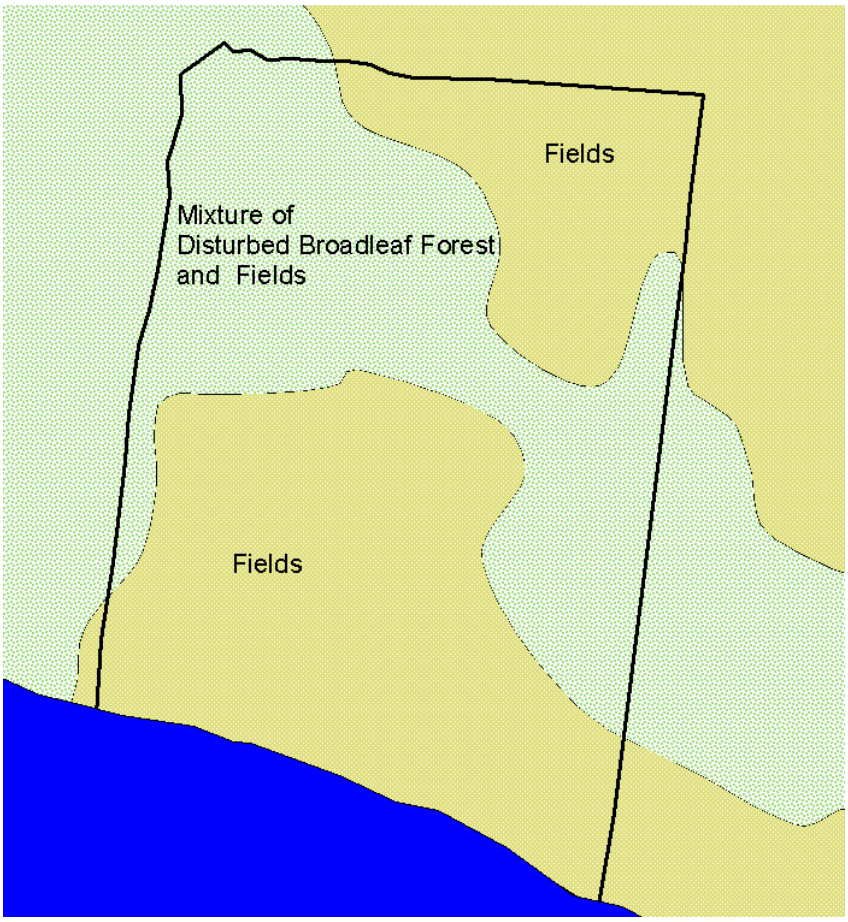


Fig. 2. Land use classes in study site according to Forestry Department

	Disturbed Forest: floristic composition with many elements of the natural vegetation; few exotic species; variety of tall trees.
	Ruinate: relatively few large trees, mainly of species of low commercial value such as *Bursera simaruba*; thick scrub; strong exotic element
	Coastal Scrub: mainly exotic species, especially Acacia and related genera; secondary vegetation on overgrown pastures
	Pasture: anthropogenic herbaceous communities; some isolated trees and scrubs
	Shore Woodland: woodland dominated by coastal trees, in particular *Coccoloba uvifera*

Fig. 3. Habitat types distinguished in present study. The picture on the left shows an example the habitat type as seen in satellite imagery (GoogleEarth).

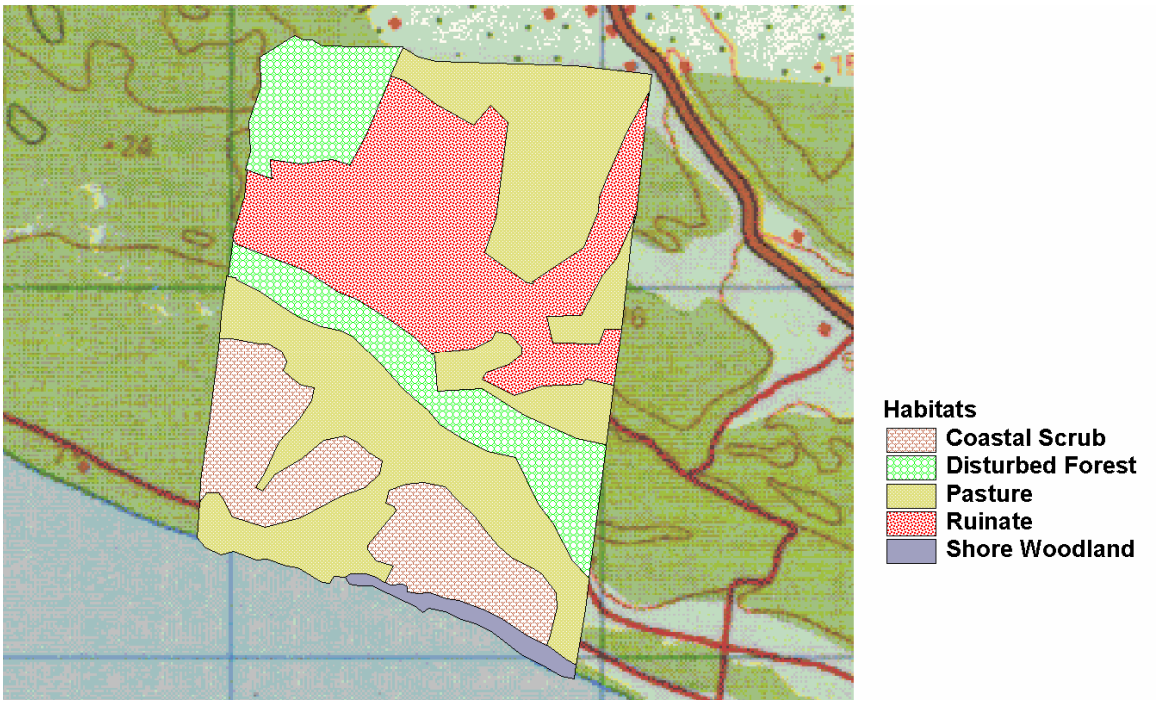


Fig. 4. Habitats distinguished in present study.

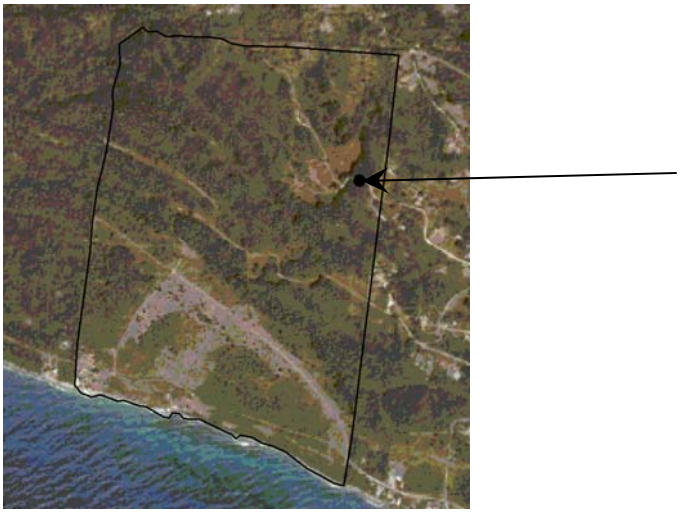


Fig. 5: Map showing Yellow Snake site

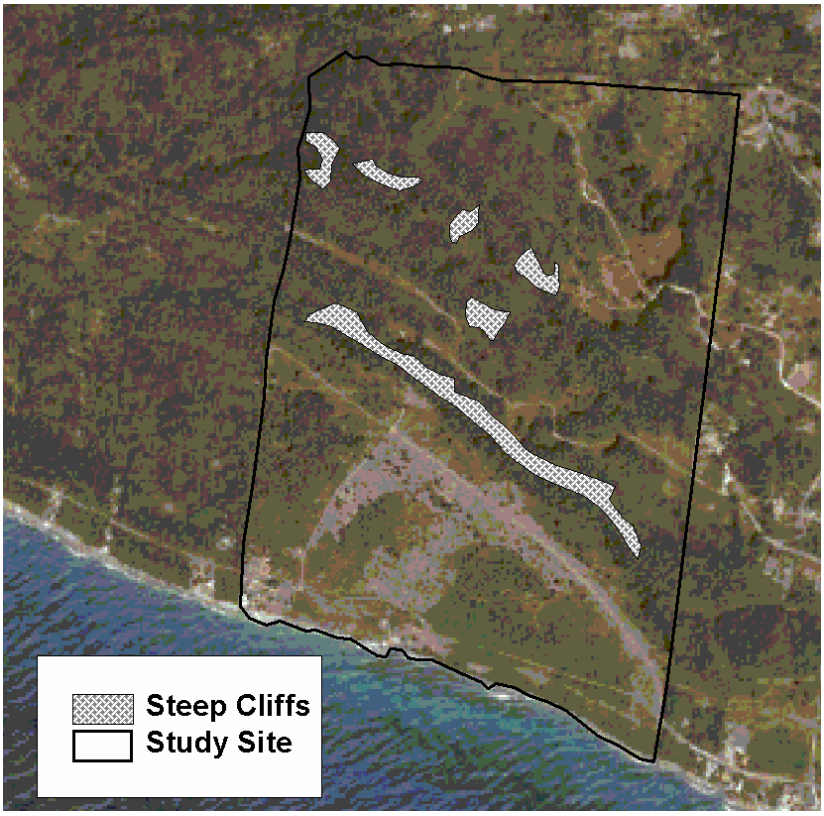


Fig. 6. Cliffs within the study area.

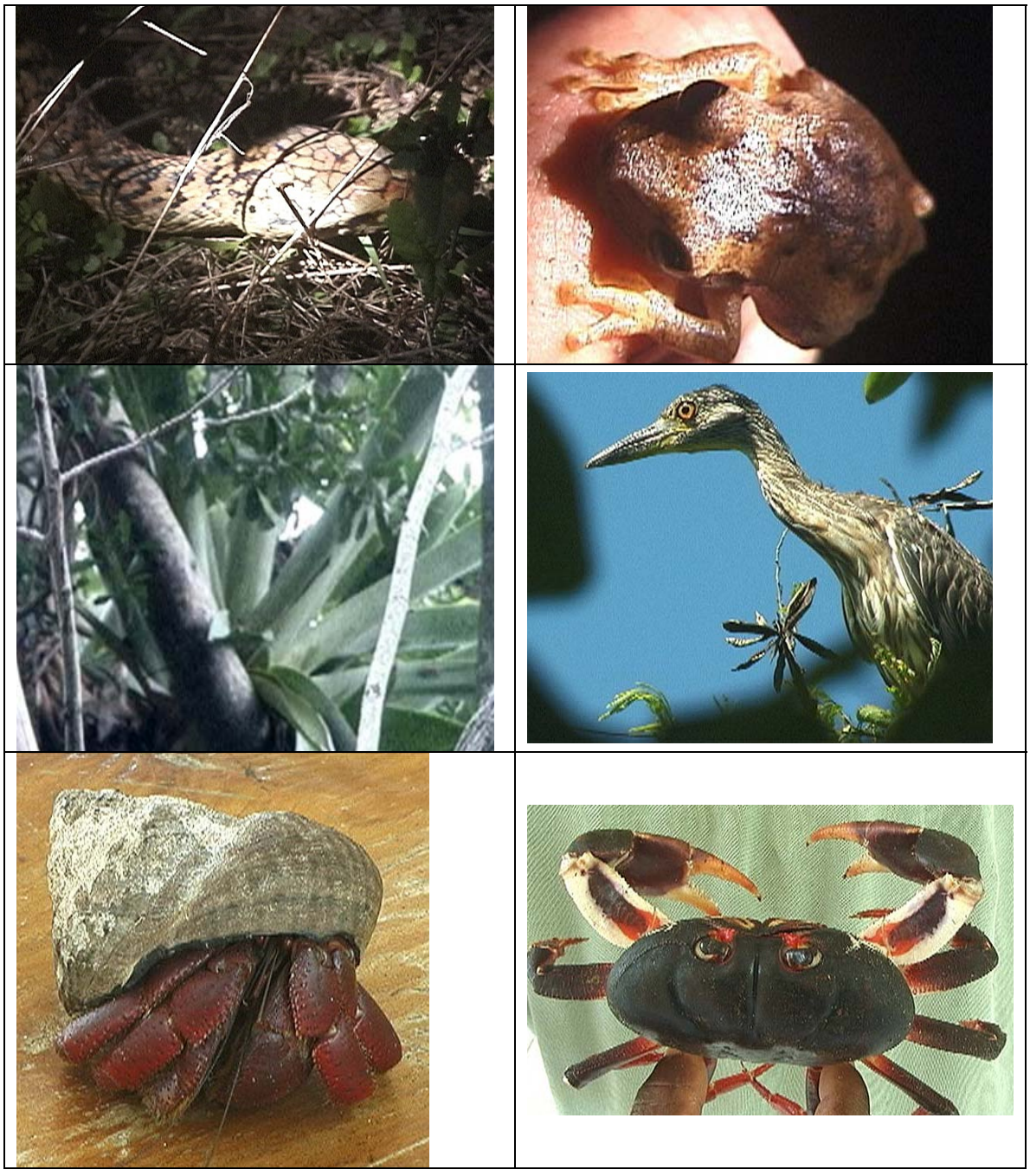


Fig. 7. Photos (from left to right, top to bottom): Jamaican Boa; Bromeliad Frog; Tank Bromeliad; Night Heron; Hermit Crab; Red Crab.

APPENDIX 22

Sand Migration

On the evening of the Public Presentation, 8th May 2007, there was a question from Mr Junior Gordon, General Manager of Negril Garden Beach Resort, concerning a previous study on sand movement from the seven mile beach in Negril and whether or not the construction of the proposed marina would have any impact on this movement and if so what was the basis of that analysis.

Mr Peter Wilson Kelly, M.A, who is a member of the EIA Consultant Team, stated that further investigations would have to be undertaken in order to answer that question fully.

Mr Wilson Kelly has investigated the report referred to at the Public Presentation and has concluded that the Marina will not have any effect on the sand movement at Long Bay in Negril. A copy of his report confirming this is enclosed in this appendix.

Report by Mr Peter Wilson Kelly on Sand Migration

Sand transport:
Where the issue of sand transport from Long Bay to West End is concerned, this is not an issue. The Negril shoreline stability study conducted by Mitchell, S., Khan, S., Maharaj, R. & Robinson, E. in 2002 did not point to sediment transport out of Long Bay towards the proposed development site nor did it point to the converse. It outlined that the source of beach sand within the Long bay area as being generated within the Long Bay area primarily from bio activity occurring within the sea grass beds adjoining the beaches.

This sand circulates between the sand source areas and the repositories on land (beaches). There is no transportation of sand from the Long Bay area to the development area on West End because the current movement does not promote this type of transport. HOWEVER, I would agree to an outlining of the manner in which currents move within the study area as a means of responding to this question.

Long shore current movements at and adjoining the site are generally westerly, as influenced by the waves pushed by southeasterly winds that the area is subjected to. The main source of sediments for the West End area are found in repositories being immediately offshore. An examination of the marine report will show that sand repositories exist within 200 meters of the shoreline. This sand would be deposited on shore during storm events - as was the case in Hurricane Ivan.

APPENDIX 23

The effect of Blasting on Marine Life

On the evening of the Public Presentation, 8th May 2007, there was a question from Ms Jackie Lewis, Proprietor of a hotel close to the proposed site called, “Jackie’s on the Reef”, concerning the effect of dynamiting on land, to assist in the excavation of the marina area and what effect it may have on the Turtles and Stingrays in the Ocean.

Peter Wilson Kelly, M.A, who is a member of the EIA Consultant Team, stated through David Walker, Negril Peninsula Resorts Ltd Director, that more investigation work would be necessary in order to answer that question correctly. David Walker also stated that if, after investigation, blasting proved to be detrimental to marine life, then the method statement would be altered and that another way of excavating the Marina would be found.

However, after further investigation and consultation with members of the EIA Consultant Team and with members of the Design Team, we have concluded that it will not be necessary to use dynamite to blast the material where the marina will be positioned.

Trial holes were originally instigated in this area last year, showing that the majority of the material is Marl. Dewhurst Macfarlane and Partners PC, who wrote the construction method for the marina and whose report dated September 06 (No 206086/1) was forwarded to NEPA as part of the Planning Application paperwork, have also confirmed that blasting is not necessary to excavate the material from the Marina area. They have confirmed this in their recent letter dated 27th May 2007, a copy of which is enclosed in this appendix.

A further investigation has also been commissioned recently and undertaken by Lyndon Audley Brown, Ph D. Who has confirmed that the material present can easily be extracted by mechanical means and that dynamiting will not be necessary to excavate the Marina, a copy of his letter is enclosed in this appendix.

We conclude that dynamiting will not be necessary for the excavation of the Marina and therefore there are no mitigation measures necessary to protect marine life against the effects of blasting.

Dewhurst Macfarlane and Partners PC
INTERNATIONAL STRUCTURAL AND FAÇADE ENGINEERS
45 East 20th Street, New York, NY 10003. Tel: +1-212-375-1600. Fax: +1-212-375-1666

206086/TGM

27 May 2007

Richard Pierce
Pierce Hill
12.G.2 The Leathermarket
Weston Street
LONDON SE1 3ER

Dear Richard

WEDDERBURN MARINA, JAMAICA

I understand that the method of excavating the marina basin and entrance channel was questioned at a recent planning enquiry meeting and concern was expressed that explosive materials would possibly be used to break up the marl and limestone

I can confirm that the soil on the site will be excavated without the use of explosives. Our report No 206086/1 issued on the 27th of September has a section describing the process of dredging to form the Marina basin and the entrance channel. No mention is made in that report of blasting and the geology of the site is such that even if there was no environmental risk in using explosives it would not be appropriate or economic to consider their use.

Yours sincerely
DEWHURST MACFARLANE AND PARTNERS PC

Tim Macfarlane

Letter from: Mr. Lyndon Audley Brown, Ph D.to Negril Peninsula Resorts Ltd.

Re: Geological Assessment for Proposed Negril Peninsula Development Site

Geological Sheet # 12 Negril identifies rocks along the Negril Peninsula as the Coastal Limestone Formation (however, described by Geologist on EIA as Iron Rocks Formation). This rocks unit is found around most of the coastal regions in Jamaica, it is a relatively young geological formation. A bit further inland the Gibraltar-Bonny-Gate Limestone Formation outcrops; this belongs to the White Limestone Group. It is interesting that this unit was described as the Montpelier Formation on the EIA, the Montpelier Formation is found to the northeast of this location. The Gibraltar-Bonny-Gate Limestone Formation is older than the Coastal Limestone, on a geological section the Coastal Limestone Formation would lay above the Gibraltar/Bonny Gate Limestone Formation.

Coastal Reef Limestone Formation is described on the Geological Sheet as being similar to the same formation found in the coast regions of Jamaica especially along the north-coast. This formation is at times described as honeycombed textured as it is eroded and forms pointed surface, somewhat similar to a karst type limestone on the surface due to wave action (difficult to walk barefooted on these rocks). This limestone is relatively soft and can be broken quite easily in the field with a hammer. The Coastal Limestone Formation has been described as being highly variable and includes marly gravely limestone with sandy, gravely and clay horizons. Because of their geographic location and ease of quarrying the Coastal Limestone has been used as a traditional source of fill. The presence of clay limits it s use as aggregate and compromises its use as inert fill.

As described on the Geological Sheet 12, the Gibraltar/Bonny Gate Limestone Formation, of the White Limestone Group forms the main mass of the Negril Hill and is a fine grained, soft to moderately hard micrite (fine-grained). In another publication, it is described as a micrite, fossil fragmented in parts with clay and chert layer.

From the publication, Economic Minerals of Jamaica, the White Limestone Group is said to have been exploited to provide aggregate, particularly in central and western Jamaica. However, the differences in physical properties within this group can lead to a wide variation in the quality of aggregate produced.

The Gibraltar/Bonny Gate Formation has been described as “soft” limestone as these are relatively soft as at times becomes chalky. However, chert nodules that are found in this formation will cause hardness which if was laterally continuous would be hard to be broken up. The chert nodules in this limestone would be responsible for any significant hardness and as the nodules are not huge it should not contribute to any difficulty in removing such rocks. Hardness of

the limestone is not expected to be widespread and hardness of the limestone can be higher than marl in these formations but not significantly as hard as crystalline limestone.
Alluvial deposits will be found in this area as depositional elements will move eroded material into low-lying areas covering the limestone formation, as seen in the borehole? that was done by investigation adjacent to this property. The stratification showed alluvial deposit overlying hard limestone then soft limestone. This density contrast would prove difficult for a seismic refraction study, i.e. harder rock above softer rock.

Based on the texture of the Gibraltar/Bonny Gate Formation it is not expected to be hard except for isolated sections, which would make the removal quite easy. This can be accomplished with the use of a mechanical excavator, where the presence of chert may contribute to extra hardness, this can be broken up by a Jack Hammer etc. and can be further broken up and removed by the mechanical excavator. The relative softness of these limestones does not warrant the use of blasting, although blasting would definitely speed up the process of excavating; due to the fragile nature of this environmental blasting would definitely be discouraged.

The geological stratification would show the Coastal Limestone overlying the Gibraltar-Bonny Gate Formation The coastal limestone has been described as being as much as 60 feet in the coastal areas this would become thinner landward where it overlies the very thick White-Limestone which is as much as 1000 ft. in sections.

The variability in the texture and hardness of the Coastal Limestone and the Gibraltar/Bonny-Gate Formation properties of the ease of weathering may not make this ideal for groyne formation due to the chalky and rubbly nature of the limestone's. Based on this property it would be expected to weather quite easily and may not be form large enough blocks to be ideal for groyne formation. As proposed, igneous rocks is more ideal for groyne formation due to their hardness and the low rate of weathering of the minerals present in these rocks.

Please note that this is information is based on published geological findings, further verification of the stratification and lithology of the site can be obtained by use of geophysical tools and boreholes. A number of boreholes can provide ground-truth to geophysical testing such as seismic refraction, electrical resistivity and ground penetrating radar (GPR), which is ideal for this environment.
If there is any further question please free to contact me.

Yours truly,

Lyndon Audley Brown, Ph.D.
Independent Geophysical and Geotechnical Consultant

APPENDIX 24

Public Notices

In Appendix 14, of the initial EIA report submitted on 10th April 2007, it shows copies of Beach Control application notices and letters that were forwarded to adjoining landowners as being part of the due process.

One of these letters was forwarded to the owners of Secret Paradise, a new resort hotel currently under construction on the coastline of the Western boundary to the proposed site.

We have now received a copy of a letter from the operators of Secret Paradise Hotel to Westmoreland Parish Council, which is enclosed in this appendix.

HOTEL MANAGEMENT PARTNERS GROUP
T/A HMPG LIMITED

May 4, 2007

Mrs. Grace Whittley
The Director of Planning
The Planning Department
Westmoreland Parish Council
Great George Street
Savanna Lamar P.O.
Westmoreland

Dear Mrs. Whittley:

Re: Negril Peninsula Resorts Ltd, Development Application,
Ref: 2660-10015-PB00368

The principals of Hotel Management Partners, Group, Inc., owners of Secret Paradise Resort, Limited, wish to express our support of the new eco-tourism resort development proposed by Negril Peninsula Resorts Limited at West End, Negril in the parish of Westmoreland.

Jamaica is one of the world's most beautiful islands, making eco-tourism vital to the protection and preservation of her natural resources. Secret Paradise Resort Limited is 70% completed and scheduled to open during 2008 is committed sustainable tourism development.

We believe that Secret Paradise Resort and the proposed Negril Peninsula Resort project create a unique opportunity to develop tourism on the West End, in a way that meets the needs of the local community and international visitors. The proposed project will also contribute substantially to increased direct and indirect employment. As such, we welcome and extend our support for this exciting project.

Sincerely,
Hotel Management Partners Group, Inc.

Vertis McManus
Managing Director

Cc: Mr. David Walker, Director, Negril Peninsula Resort Limited
Dr. Wykeham McNeil, MP, Eastern Westmoreland

28 HARBOUR STREET
PORT ANTONIO
PORTLAND JAMAICA
TEL: 876 715 6400
FAX: 876 715 6406

"Where Service Is Everything"

APPENDIX 25

Revisions

After further conversations and consultations with N.E.P.A. (National Environment Planning Agency), J.E.T. (Jamaican Environment Trust), J.E.A.N. (Jamaican Environmental Advocacy Network) and Dr Eric Garraway (University of the West Indies, and conductor of the recent nocturnal study), Negril Peninsula Resorts Ltd have decided to alter the proposed layout to incorporate a number of alterations suggested by these organizations and / or individuals.

The redrawn plans have had the effect of reducing the number of building footprints by a total of 85 buildings, nearly a reduction of 16%, to accomodate the constructive comments made below:

1. Re-plan and relocate open space and green areas to allow areas worthy of retention to be located within them and to provide cross development links with controlled walkways via boardwalks and to provide cluster type development more in keeping with this part of Jamaica. This has resulted in substantially more open space being provided.
2. Specimens of the newly found Agave oberlii are to be left in place on certain cliff faces as many buildings have been removed and a buffer zone free of buildings from the base of the sensitive cliffs has been created.
3. The best specimen mature native trees found on the site are growing on the main cliff face (east to west) and several others to the North West area of the site. As these cannot be transplanted elsewhere the buildings affecting them have been removed and buffer zones created at the base to protect these cliff faces.
4. Tank bromeliads and epiphytic orchids are supported by these trees, which in turn support endemic frogs and other animals. These can now all remain now because of the omission of buildings in these areas.
5. The birds within the site are mainly or exclusively occurring in the trees on the cliff faces, these will obviously also benefit from the retention of these areas.
6. A small number of bats use the caves within these cliff faces and the buffer zone, mainly consists of rocks and boulders that have fallen from the cliff, will preserve the habitat around where the bats roost and will give other animals protection, such as the Jamaican Boa which could use the rock crevices as daylight hiding places. The trees and the abundant vertebrate prey which these areas will hold will allow the Boa to hunt at night.
7. These new wildlife zones adjacent to the various cliffs will also provide a haven for many aesthetically important species, such as butterflies and fire flies and could be enhanced in areas by the transplanting of endemic species from elsewhere on the site.
8. All of these wildlife zones can be protected from the very start of the construction process by protective fencing. The erection and positioning of this fencing can be supervised by qualified wildlife experts who can also train the construction staff in spotting anything of high interest so it can be removed to these wildlife protection zones for safety.

These new plans incorporating these changes, along with a new phased accommodation schedule, drawing register and a small selection of renderings are contained within this appendix.

Key

- Residential
- Parkland/Amenity
- Marina
- Beach
- Beach Resort
- Spa Hotel
- Sports/Recreation Hotel
- Commercial/Retail
- Municipal Buildings
- Support
- Medical/Security Centre
- Recycling/Sorting Centre & Sewage Treatment Plant

Numbering relates to possible dwelling unit numbers (1202 total).

Helipad

Section occupied by Herbert Bell Jnr.

288

110

117

190

15

29

45

65

81

11

82

53

20

20

20

20

20

20

Secret Paradise development

Negril Peninsula
Wedderburn -Land Use Zoning
P215A.-S.03 Rev H
A1 - 1:2500 A3 - 1:5000
MAy 2007

0 100 200 300 400 500m

hd
Harper_Downie
design architecture

Section occupied by
Herbert Bell Jnr.

Secret Paradise
development

Negril Peninsula
Wedderburn - Design Plan
P215A.-S.05 Rev G
A1 - 1:2500 A3 - 1:5000
May 2007

0 100 200 300 400 500m

hd
Harper_Downie
design architecture

Key

1 Storey
2 Storey
3 Storey

House Type	Plan Number
Cliff House	C+E
Cliff House	C+2E
Villa	M
Villa	2M
House	I
House	2I
House	G
House	2G
Apartments	3M

Section occupied by Herbert Bell Jnr.

Secret Paradise development

Negril Peninsula
Wedderburn - Storey Height/Density Plan
P215A.S-04 REV H
A1 - 1:2500 A3 - 1:5000
May 2007

0 100 200 300 400 500m

hd
Harper_Downie
design architecture

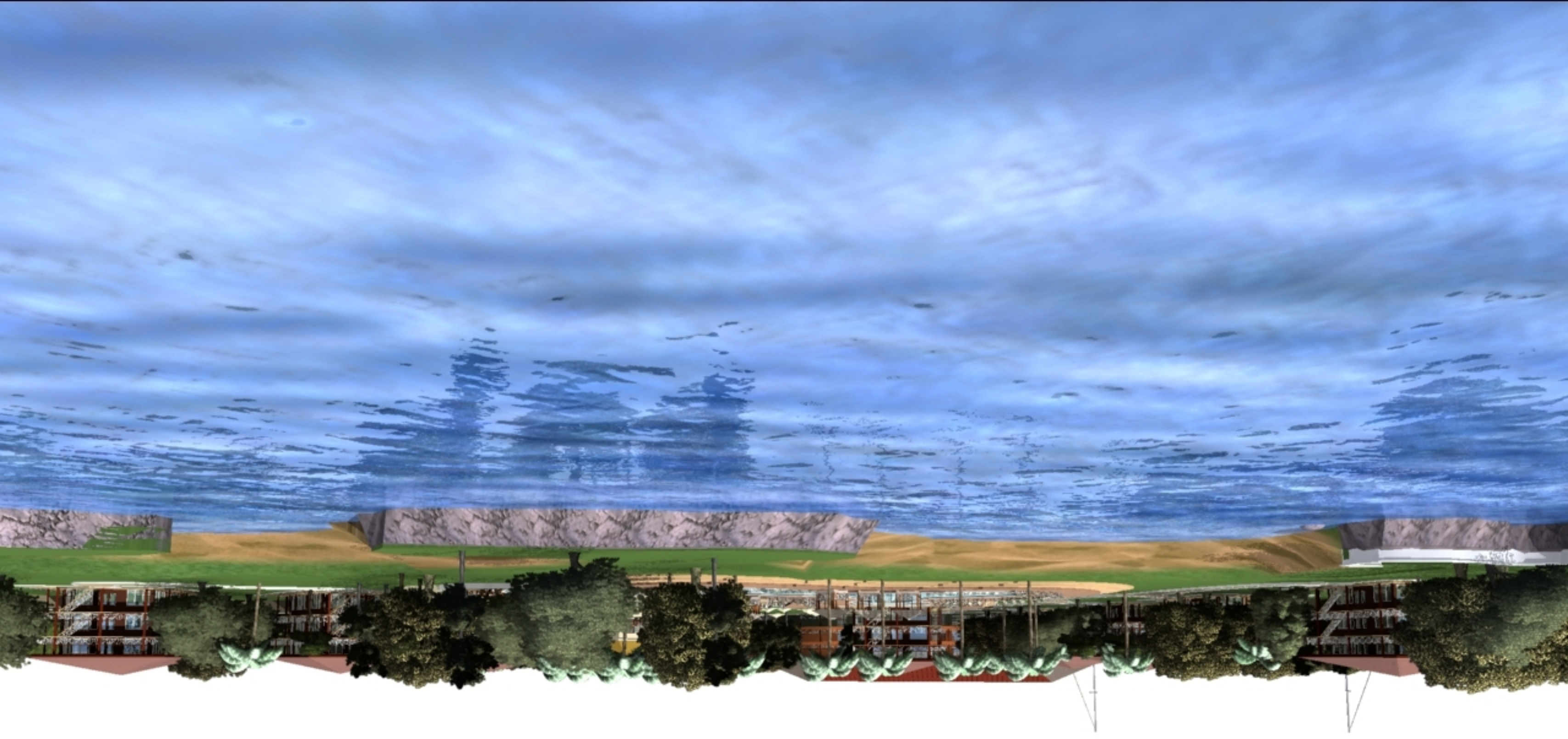
Section occupied by
Herbert Bell Jnr.

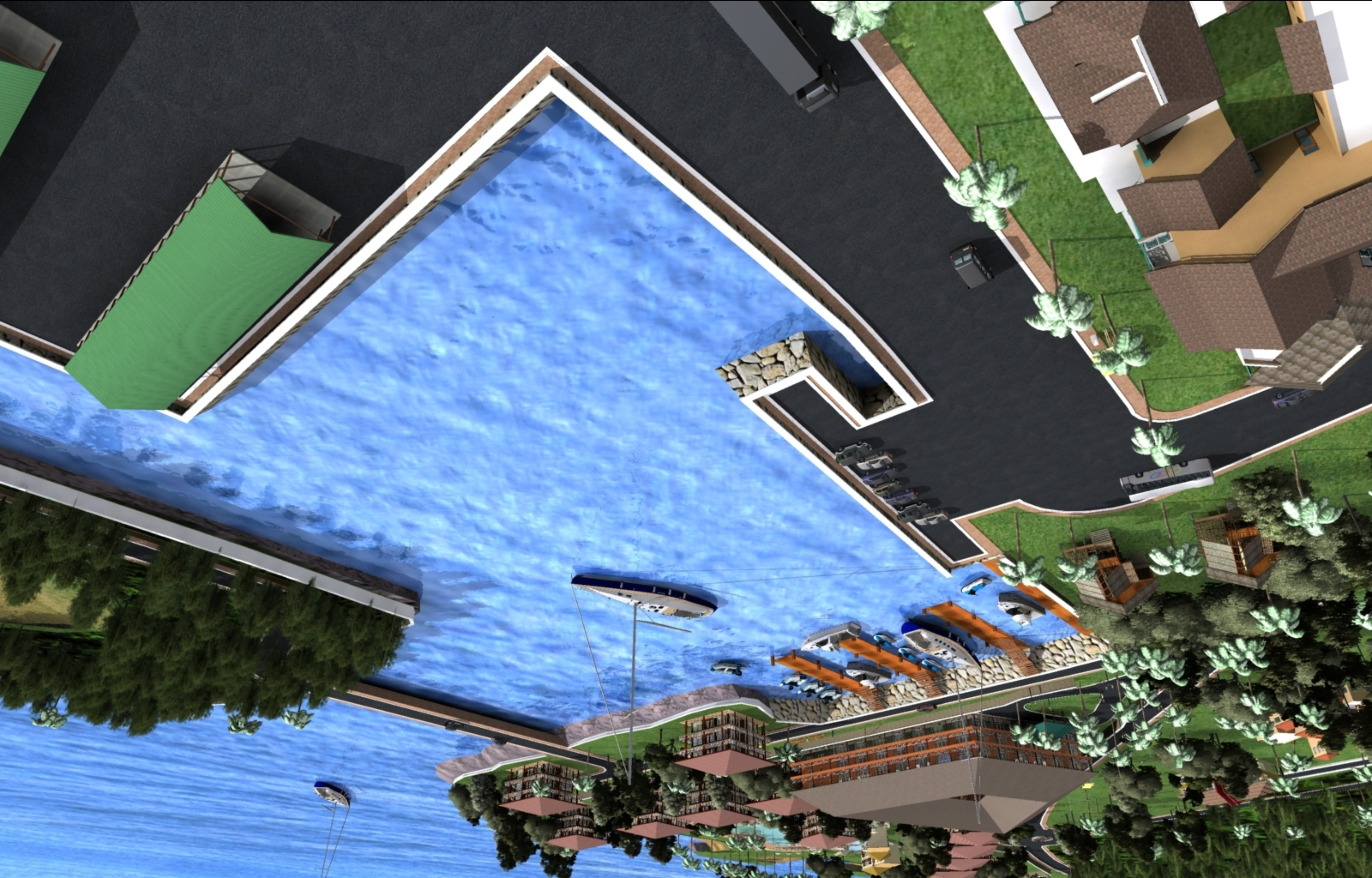
Secret Paradise
development

Negril Peninsula
Wedderburn - Roads/Infrastructure
P215A.-S.02 Rev F
A1 - 1:2500 A3 - 1:5000
May 2007

0 100 200 300 400 500m

hd
Harper_Downie
design architecture





6.0 Schedule of Accomodation **12-Jun-07 Altered to show changes to plans along cliff`s**

HOUSE TYPE	NUMBER OF DWELLINGS AND/OR BUILDINGS	HABITABLE ROOMS PER DWELLING/ BUILDING	TOTAL HABITABLE ROOMS	RESIDENTIAL NIA COMMERCIAL GEA PER DWELLING/ BUILDING M2	FT2	TOTAL RESID ENTIAL NIA O R TOTAL COMM ERCIAL GEA M2	FT2
Anticipated PHASE 1							
Cliff house C+E	2	3	6	67.5	726	135	1,452
Cliff house C+2E	9	3	27	67.5	726	608	6,534
Villa 3M	135	7	945	271.4	2,921	36,639	394,335
House 2G	12	4	48	90.7	977	1,088	11,724
Penthouse Apts over commercial bldgs K-O	82	4	328	112.0	1,214	9,184	99,548
Marina Apts	120	5	600	104.2	1,122	12,504	134,640
Apts over retail BLDG`s C,D,E,F,G TYPE A	57	2	114	60.8	655	3,466	37,335
Apts over retail BLDG C TYPE B	2	2	4	74.7	804	149	1,608
Apts over retail BLDG`s D,F TYPE B	4	2	8	68.8	741	275	2,964
Apts over retail BLDG E TYPE B	4	2	8	69.3	746	277	2,984
Apts over retail BLDG G TYPE B	4	2	8	58.2	626	233	2,504
Apts over retail BLDG C TYPE C	2	2	4	71.4	769	143	1,538
Apts over retail BLDG`s D,F TYPE C	4	2	8	66.3	714	265	2,856
Apts over retail BLDG`s F TYPE D	4	3	12	69.3	746	277	2,984
Beach Hotel	1	92	92	5,726.1	61,635	5,726	61,635
Beach Hotel serviced apartments 3 storey	33	4	132	106.2	1,143	3,505	37,719
Beach Hotel serviced apartments 2 storey	4	4	16	106.2	1,143	425	4,572
Commercial Building A	1	0	0	4,500	48,438	4,500	48,438
Commercial Building B	1	0	0	4,032	43,401	4,032	43,401
Commercial Building C	1	0	0	3,469	37,340	3,469	37,340
Commercial Building D	1	0	0	3,378	36,364	3,378	36,364
Commercial Building E	1	0	0	7,863	84,636	7,863	84,636
Commercial Building F	1	0	0	3,034	32,654	3,034	32,654
Commercial Building G	1	0	0	5,700	61,354	5,700	61,354
Commercial Building H	1	0	0	6,586	70,887	6,586	70,887
Commercial Building J	1	0	0	1,359	14,625	1,359	14,625
Commercial Building K	1	0	0	6,486	69,814	6,486	69,814
Commercial Building L	1	0	0	12,045	129,650	12,045	129,650
Commercial Building M	1	0	0	9,155	98,544	9,155	98,544
Commercial Building N	1	0	0	14,935	160,754	14,935	160,754
Commercial Building O	1	0	0	11,758	126,566	11,758	126,566
Marina Building A	3	0	0	1,081	11,632	3,242	34,896
Marina Building B	1	0	0	1,391	14,976	1,391	14,976
Potential J.D.F. Coastgaurd Station.	3	4	12	106.2	1,143	319	3,429
Medical/Security Centre	1	0	0	5,904	63,549	5,904	63,549
Sewage Treatment Plant	1	0	0	0	0	0	0
						CONTINUED OVER	

Anticipated PHASE 2							
Villa 3M	180	7	1,260	271.4	2,921	48,852	525,780
Villa 2M	6	7	42	271.4	2,921	1,628	17,526
House 2G	172	4	688	90.7	977	15,600	168,044
Spa Hotel Building A	1	0	0	1,541	16,593	1,541	16,593
Spa Hotel Building B	1	0	0	3,369	36,264	3,369	36,264
Spa Hotel serviced apartments C	12	6	72	310.8	3,345	3,730	40,140
Spa Hotel serviced apartments D	6	5	30	234.2	2,521	1,405	15,126
Anticipated PHASE 3							
Villa M	5	7	35	271.4	2,921	1,357	14,605
Villa 2M	4	7	28	271.4	2,921	1,086	11,684
Villa 3M	141	7	987	271.4	2,921	38,267	411,861
House 2G	160	4	640	90.7	977	14,512	156,320
House I	3	4	12	138.0	1,486	414	4,458
House 2I	90	4	360	138.0	1,486	12,420	133,740
Equestrian Hotel	1	92	92	5,726	61,635	5,726	61,635
Equestrian Hotel serviced apartments	2	2/3	84	5,993	64,506	11,986	129,012
Anticipated PHASE 4							
Municple Building A	1	0	0	6,161.4	66,321	6,161	66,321
Municple Building B	2	0	0	4,194.0	45,144	8,388	90,288
Municple Building C	1	0	0	3,658.2	39,376	3,658	39,376
Municple Building D	1	0	0	3,230.6	34,773	3,231	34,773
Support Building A	3	0	0	6,161.4	66,321	18,484	198,963
Support Building D	1	0	0	3,230.6	34,773	3,231	34,773
TOTALS	**1,295**		**6,702**			**385,101**	**4,146,091**

TOTAL RESIDENTIAL DWELLINGS	**1,202**	**TOTAL RESIDENTIAL NIA AREA**	**2,147,024**
TOTAL OTHER INDIVIDUAL BUILDINGS	**93**	**TOTAL COMMERCIAL GEA AREA**	**1,999,067**
TOTAL	**1,295**	**GRAND TOTAL**	**4,146,091**

LAND USE	APPROX AREAS		APPROX BUILD AREAS	
	HECTARES	ACRES	M2	FT2
Residential	78	190	194,702	2,095,180
Parkland/Amenity	20	52		
Marina	5	13		
Beaches	5	13		
Beach Hotel	3	7	9,337	100,498
Spa Hotel	3	8	10,045	108,122
Equestrian Hotel	2	5	17,712	190,648
Commercial/Retail	13	31	98,933	1,064,907
Municiple Buildings	3	6	21,715	233,737
Support Buildings	5	12	33,761	363,401
Medical/Security Centre	2	4	5,904	63,551
Sundry,Roads etc.	8	20		
TOTALS	**147**	**361**	**392,109**	**4,220,044**

WEDDERBURNS DRAWING SCHEDULE PLANNING SUBMISSION

DRAWING NUMBER	REVISION	DATE	NAME
HARPER DOWNIE			
P215A.-S.01	B	Oct-06	TOPOGRAPHIC STUDY
P215A.-S.02	F	May-07	ROADS/INFRASTRUCTURE
P215A.-S.03	H	May-07	LAND USE ZONING
P215A.-S.04	H	May-07	STOREY HEIGHT/DENSITY PLAN
P215A.-S.05	G	May-07	DESIGN PLAN
P215A.-S.06	A	Sep-06	EXISTING PROPERTY BOUNDARIES
P215A.-S.07	E	Oct-06	INDICATIVE PLOT LAYOUTS
P215A GA 10	A	Oct-06	TYPE C and E PLANS AND ELE`s CAD
P215A GA 11	-	Oct-06	TYPE 1G PLAN & ELE`S CAD
P215A GA 12	-	Oct-06	TYPE 2G PLAN & ELE`S CAD
P215A GA 13	-	Oct-06	TYPE I PLAN & ELE`S CAD
P215A GA 14	-	Oct-06	TYPE 2I PLAN & ELE`S CAD
P215A GA 15	-	Oct-06	TYPE 1M PLAN & ELE`S CAD
P215A GA 16	-	Oct-06	TYPE 2M PLAN & ELE`S CAD
P215A GA 17	-	Oct-06	TYPE 3M PLAN & ELE`S CAD
P215A GA 18	-	Oct-06	TYPE MARINA APPARTMENTS FIRST FLOOR & GROUND FLOOR & ELE`S CAD
P215A GA 21	B	Oct-06	COMMERCIAL BLDG A……MARKET
P215A GA 22	B	Oct-06	COMMERCIAL BLDG B
P215A GA 23	B	Oct-06	COMMERCIAL BLDG C……2 FLOORS COMMERCIAL 3RD APARTMENTS A,B,C TYPES
P215A GA 24	B	Oct-06	COMMERCIAL BLDG D……2 FLOORS COMMERCIAL 3RD APARTMENTS A,B,C TYPES
P215A GA 25	B	Oct-06	COMMERCIAL BLDG E……2 FLOORS COMMERCIAL 3RD APARTMENTS A,B, TYPES
P215A GA 26	B	Oct-06	COMMERCIAL BLDG F……2 FLOORS COMMERCIAL 3RD APARTMENTS A,B,C,D TYPES
P215A GA 27	B	Oct-06	COMMERCIAL BLDG G……2 FLOORS COMMERCIAL 3RD APARTMENTS A,B, TYPES
P215A GA 28	B	Oct-06	COMMERCIAL BLDG H……3 FLOORS COMMERCIAL
P215A GA 30	B	Oct-06	COMMERCIAL BLDG J….COMMERCIAL & OPEN AIR THEATRE
P215A GA 31	B	Oct-06	COMMERCIAL BLDG K….COMMERCIAL & 3RD FLOOR PENT APTS
P215A GA 32	B	Oct-06	COMMERCIAL BLDG L….COMMERCIAL & 3RD FLOOR PENT APTS
P215A GA 33	B	Oct-06	COMMERCIAL BLDG M….COMMERCIAL & 3RD FLOOR PENT APTS
P215A GA 34	B	Oct-06	COMMERCIAL BLDG N….COMMERCIAL & 3RD FLOOR PENT APTS
P215A GA 35	B	Oct-06	COMMERCIAL BLDG O….COMMERCIAL & 3RD FLOOR PENT APTS
P215A GA 41	B	Oct-06	MUNICIPLE BUILDING A
P215A GA 42	B	Oct-06	MUNICIPLE BUILDING B
P215A GA 43	B	Oct-06	MUNICIPLE BUILDING C
P215A GA 44	B	Oct-06	MUNICIPLE BUILDING D
P215A GA 45	B	Oct-06	MEDICAL/POLICE STATION
P215A GA 46	A	Oct-06	MARINA BLDG A
P215A GA 47	A	Oct-06	MARINA BLDG B
P215A GA 51	B	Oct-06	92 BEDROOM BEACH HOTEL GRD/1ST/2ND
P215A GA 52	B	Oct-06	BEACH HOTEL SERVICED APARTMENTS
P215A GA 53	-	Oct-06	SPA HOTEL BLDG A
P215A GA 54	-	Oct-06	SPA HOTEL BLDG B
P215A GA 55	A	Oct-06	SPA HOTEL BLDG C
P215A GA 56	A	Oct-06	SPA HOTEL BLDG D
P215A GA 57	-	Oct-06	93 BEDROOM EQUESTRIAN HOTEL BLDG A
P215A GA 58	-	Oct-06	92 BEDROOM EQUESTRIAN HOTEL BLDG B
DEWHURST MacFARLAND			
206085/001/	-	Oct-06	HARBOUR DETAILS
AEBC ENGINEERING			
06215 SEW-P-MR-A-000	A	20-Oct-06	Sewage supply along main road to project site Zone A
06215 SEW-P-MR-B-000	A	20-Oct-06	Sewage supply along main road to project site Zone B
06215 WAT-P-MR-A-000	A	20-Oct-06	Water supply along main road to project site Zone A
06215 WAT-P-MR-B-000	A	20-Oct-06	Water supply along main road to project site Zone B
06215 SEW-P-00-A-000	A	12-Oct-06	Sewage layout zone A
06215 SEW-P-00-B-000	A	12-Oct-06	Sewage layout zone B
06215 SEW-P-00-C-000	A	12-Oct-06	Sewage layout zone C
06215 SEW-P-00-D-000	A	12-Oct-06	Sewage layout zone D
06215 WAT-P-00-A-000	A	12-Oct-06	Water Supply Layout Zone A
06215 WAT-P-00-B-000	A	12-Oct-06	Water Supply Layout Zone B
06215 WAT-P-00-C-000	A	12-Oct-06	Water Supply Layout Zone C
06215 WAT-P-00-D-000	A	12-Oct-06	Water Supply Layout Zone D
06215 STW-P-00-A-000	A	12-Oct-06	Storm water drainage zone A
06215 STW-P-00-B-000	A	12-Oct-06	Storm water drainage zone B
06215 STW-P-00-C-000	A	12-Oct-06	Storm water drainage zone C
06215 STW-P-00-D-000	A	12-Oct-06	Storm water drainage zone D
06215 ELE-P-00-A-000	A	12-Oct-06	Electrical Layout Zone A
06215 ELE-P-00-B-000	A	12-Oct-06	Electrical Layout Zone B
06215 ELE-P-00-C-000	A	12-Oct-06	Electrical Layout Zone C
06215 ELE-P-00-D-000	A	12-Oct-06	Electrical Layout Zone D
AEBC ARCHITECTURAL			
P215 - S01	A	02-Jun-07	Streetscape of Villas
P215 - S02	A	02-Jun-07	Streetscape of Villas
P215 - S03	A	02-Jun-07	Streetscape of Villas
P215 - S04	A	02-Jun-07	Streetscape of Villas
P215 - S05	A	02-Jun-07	Streetscape of Villas
P215 - S06	A	02-Jun-07	Streetscape of Villas
P215 - S07	A	02-Jun-07	Streetscape of Villas
P215 - S08	A	02-Jun-07	Streetscape of Villas
P215 - S09	A	02-Jun-07	Streetscape of Villas
P215 - S10	A	02-Jun-07	Streetscape of Villas

P215 - S11	A	02-Jun-07	Streetscape of Villas
P215 - S12	A	02-Jun-07	Streetscape of Villas
P215 - S13	A	02-Jun-07	Streetscape of Villas
P215 - S14	A	02-Jun-07	Streetscape of Villas
P215 - B01	A	02-Jun-07	Beach Hotel
P215 - B02	A	02-Jun-07	Beach Hotel
P215 - B03	A	02-Jun-07	Beach Hotel
P215 - B04	A	02-Jun-07	Beach Hotel
P215 - B05	A	02-Jun-07	Beach Hotel
P215 - B06	A	02-Jun-07	Beach Hotel
P215 - B07	A	02-Jun-07	Beach Hotel
P215 - B08	A	02-Jun-07	Beach Hotel
P215 - B09	A	02-Jun-07	Beach Hotel
P215 - B10	A	02-Jun-07	Beach Hotel
P215 - B11	A	02-Jun-07	Beach Hotel
P215 - B12	A	02-Jun-07	Beach Hotel
P215 - B13	A	02-Jun-07	Beach Hotel
P215 - B14	A	02-Jun-07	Beach Hotel
P215 - B15	A	02-Jun-07	Beach Hotel
P215 - B16	A	02-Jun-07	Beach Hotel
P215 - B17	A	02-Jun-07	Beach Hotel
P215 - B18	A	02-Jun-07	Beach Hotel
P215 - B19	A	02-Jun-07	Beach Hotel
P215 - B20	A	02-Jun-07	Beach Hotel