

***Molluscs of Southgate and Green Cay Sound:***



Scaphopods



Bivalves

Gastropods



Chitons



***Seashells found on the Barrier Beach***

THE COAST & HARBOR INSTITUTE  
WOODS HOLE, MASSACHUSETTS USA

January 2004

Prepared for

St. Croix Environmental Association  
Gallows Bay, St. Croix  
U.S.V.I.

# **MOLLUSCS OF SOUTHGATE AND GREEN CAY SOUND:**

**Seashells found on the Barrier Beach**

by

**William B. Gladfelter and Elizabeth H. Gladfelter \***

**\*Marine Policy Center**

**Woods Hole Oceanographic Institution**

**Woods Hole, Massachusetts 02543**

January 2004

Coast & Harbor SCR Technical Report # 8

Cover photographs: shells collected by W.B. Gladfelter. Scapohopods: *Dentalium eboreum* and an unidentified species; Gastropod: *Conus mus*; Bivalve: *Tellina radiata*; Chiton: *Chiton tuberculata* (photos by E. H. Gladfelter and A.G. Gaines)

### Southgate Seashells

A total of 164 species of mollusc shells, representing the five common classes of Mollusca: Gastropoda (snails; cover bottom left), Scaphopoda (tusk shells; cover top left), Polyplacophora (chitons; cover bottom right), Bivalvia (bivalves; cover top right) and Cephalopoda (cephalopods), were collected and identified from Southgate Beach (Table I) by William B Gladfelter (WBG). Amazingly, 145 of these species (representing 88% of the species found on this beach) were found on a single day.

On November 1, 2002, a synoptic collection of 145 species of mollusc shells was made at Southgate barrier beach. Large northerly swells the previous week had washed in an extraordinary accumulation of shells on this as well as other north coast beaches (e.g., St. Croix Yacht Club). Although previous collections had been made at Southgate (by WBG, e.g., winter 2000, after Hurricane Lenny, as well as after Hurricane Marilyn) the 2002 collection contained by far the greatest number of species. This trip yielded more species, and in fact, was the single most diverse collection at any St. Croix site by W.B. Gladfelter in many years of serious shelling. An additional collection made the following day yielded only 5 additional species. A dozen further species had been collected in the 2000 collection (indicated in Table I in column marked "collected 2000"), which had a total of 102 species, considered quite a large amount at that time. The only cephalopod represented, *Spirula spirula* had been found at various other times in visits to this beach in years past.

The 164 species listed for Southgate represent about 60% of the total number of species that William Gladfelter collected on the beaches of St. Croix. The high diversity of seashells washed ashore on Southgate barrier beach is probably a result of both favorable biological as well as physical factors. It also suggests that shells brought ashore do not physically survive long in the littoral mill, in which beach sand is produced from wave action playing upon calcareous biological structures. The rich diversity of microhabitats in the seagrass beds and coral reefs found offshore in Green Cay Sound (see Gladfelter and Gladfelter, 2004) appears to support an equally rich diversity of molluscs. Interestingly, many of these species are rarely observed alive. They undoubtedly either live in cryptic environments or are rare. The combination of the complex mosaic of an island, peninsulas, reefs, sand patches and seagrass beds with the prevailing wind and wave conditions may foster the funneling of the seashells into shore at the Southgate barrier beach.

While most of these mollusc species found at Southgate are common to most Virgin Island beaches at one time or another, a number of unique or unusual species were also found in the 2002 collection (even a few not heretofore collected in St. Croix or other Virgin Islands, or anywhere by W.B Gladfelter). Table I indicates the relative abundance of the different species present in the beach deposits: A = abundant; C = common; U = uncommon; R = rare (with the actual number of specimens found on 1-2 Nov 2003 in parentheses). The condition of the specimens collected at this time is indicated in the column labeled "Good new specimens collected". A good (or the best available) shell from each species was gathered to form a synoptic collection for the St. Croix Environmental Association (SEA).

Most of the shells collected at Southgate have already been photographed and eventually photographs of all of them will be available as digital files. The shell collection described herein will eventually be available for use by the serious student; at present it resides with the junior author (E.H. Gladfelter).

On November 1, most specimens were collected from localized thick deposits of gravel and rubble (coral fragments, shells, and other carbonate debris); but, on November 2, most of the material in these coarse deposits disappeared and apparently had been buried by sand overnight or washed seaward. The presence of such large quantities of shells and other carbonate debris appears to have been due to the action of a series of large northerly swells for several days the preceding week.

It is not possible to tell the extent of marine habitat from which the shells had come, perhaps from as far offshore as the outermost set of shallow reefs due north of the beach (about 400-800 meters away). Some of the molluscan species were only represented by broken old shells (dead several years at least judging from wear and encrustation) and may have been in the process of moving shoreward for a long time.

In any case, it is clear that there has been a highly diverse molluscan fauna in the shallow waters off Southgate Beach and that the shell assemblages of the beach are periodically replenished by storm-generated swells and waves.

Although the value of preserving biodiversity among plants and animals on Earth is widely recognized in abstract, it is not common that the true meaning of biodiversity can be readily observed in nature. Nor is it widely appreciated that the skills required to identify biotic species are waning in our academic institutions and in some instances are at the brink of extinction themselves. Finally, it is not widely recognized that very few of the life histories of the molluscs collected as shells at Southgate are understood even in outline. The new Southgate Coastal Reserve provides a fresh opportunity to address all of these matters.

## References

- Abbott, R.T., and P.A. Morris, 1995. *A Field Guide to Shells: Atlantic and Gulf coasts and the West Indies*. 4<sup>th</sup> edition. Houghton Mifflin, New York. 349 pp.
- Gladfelter, W.B. and E.H. Gladfelter, 2004. *Living Marine Systems in Green Cay Sound*. SCR Technical Report #7, The Coast & Harbor Institute, Woods Hole, MA. 19 pp.

Table 1. Mollusc shell species collected at Southgate barrier beach on November 1, 2002 (and/or during the year 2000) by W.B. Gladfelter.

CLASS		Collected		Specimen
GASTROPODA	Species	2000	Abundance	Collected
FAMILY				
FISSURELLIDAE				
(keyhole limpets)	<i>Fissurella angusta</i>	x	C	x
	<i>F. barbadensis</i>	x	C	x
	<i>F. fascicularis</i>	x	R(3)	x
	<i>Diodora cayenensis</i>		R (4 or 5)	x
	<i>D. listeri</i>	x	C/U	x
	<i>D. viridula</i>		R(1)	x
	<i>Lucapina suffusa</i>		R(2)	x
	<i>Hemitoma octoradiata</i>	x	C	x
ACMAEIDAE				
(true limpets)	<i>Lottia pustulata</i>	x	C	x
	<i>L. antillarum</i>	x	U	x
	<i>L. leucopleura</i>	x	U	x
TROCHIDAE				
(top shells)	<i>Calliostoma jujubinum</i>	x	R(4 & frag)	x
	<i>C. pulchrum</i>		R(2)	x
	<i>Cittarium pica</i>	x	R(2 frags)	
	<i>Tegula fasciata</i>	x	C	
	<i>T. lividomaculata</i>		U	x
TURBINIDAE				
(turbans)	<i>Turbo canaliculatus</i>		R(1 brkn)	
	<i>T. castaneus</i>	x	A	x
	<i>Astraea americana</i>	x	R(1)	
	<i>A. coelata</i>	x	U	x
	<i>A. phoebia</i>	x	A	?
	<i>A. tuber</i>	x	U	x
NERITIDAE				
(nerites)	<i>Nerita tessellata</i>	x	C	x
	<i>N. versicolor</i>	x	U	x
	<i>Neritina clenchi</i>		C	
	<i>Smaragdia viridis</i>	x	C	x
PHASIANELLIDAE				
(pheasant shells)	<i>Tricolia tessellata*</i>		R(1)	
LITTORINIDAE				
(periwinkles)	<i>Tectarius muricatus</i>	x	U	x
TURRITELLIDAE				
(turret-shells)	<i>Vermicularia knorri</i>	x	U	brkn

CLASS	Species	Collected 2000	Abundance	Specimen Collected
<b>GASTROPODA</b>				
<b>VERMETIDAE</b>				
(worm-shells)	<i>Petaloconchus erectus</i>		U/C	x
	<i>P. irregularius</i>	x	U/C	x
	<i>P. nigricans</i>	x	U/C	?
	<i>Serpulorbis decussata</i>	x	U/C	x
<b>MODULIDAE</b>				
(modulus)	<i>Modulus modulus</i>		R(1)	
	<i>M. carchedonius</i>		U	
<b>POTAMIDIDAE</b>				
(horn shells)	<i>Cerithidea sp??*</i>		R(1)	
<b>CERITHIIDAE</b>				
(horn shells)	<i>Ceithium eburneum</i>	x	A	x
	<i>C. litteratum</i>	x	A	x
	<i>C. lutosum</i>	x	A	x
	<i>C. sp.??</i>		C	
	<i>Cerithiopsis emersoni*</i>		R(2)	
<b>HIPPONICIDAE</b>				
(hoof shells)	<i>Hipponyx antiquatus</i>		C	x
	<i>H. rufus</i>	x		
<b>CREPIDULIDAE</b>				
(slipper shells)	<i>Cheilea equestris</i>	x	R (3 or 4)	x
<b>XENOPHORIDAE</b>				
(carrier shells)	<i>Xenophora conchyliophora</i>	x	R(1)	
<b>STROMBIDAE</b>				
(conchs)	<i>Strombus gigantea</i>	x	U/C	
	<i>S. gallus</i>		R (2 frags)	
	<i>S. costatus</i>	only		
	<i>S. raininus</i>	only		
<b>NATICIDAE</b>				
(moon shells, ear shells)	<i>Polinices lactea</i>	x	C	x
	<i>Natica canrena</i>	x	R(3 & frags)	x
<b>CYPRAEIDAE</b>				
(cowries)	<i>Cypraea spurca</i>	x	R (2-3 worn)	
	<i>C. cinerea</i>	x	U	x
	<i>C. zebra</i>	x	R(1 L frag & juv)	x

CLASS	Species	Collected 2000	Abundance	Specimen Collected
<b>GASTROPODA</b>				
<b>ERATOIDAE</b>				
(sea buttons)	<i>Trivia pediculus</i>	x	C	x
	<i>T. suffusa</i>	x	U/C	x
	<i>T. quadripunctatus</i>		U/C	x
<b>OVULIDAE</b>				
(simnias)	<i>Cyphoma gibbosa</i>	x	R(3)	
<b>CASSIDAE</b>				
(helmet shells)	<i>Phalium granulatum</i>	only		
	<i>Cypraecassis testiculus</i>	x	R (2 frag)	
	<i>Cassis</i> sp.	x	R (2 frag)	
<b>RANELLIDAE</b>				
(tritons)	<i>Cymatium caribbaeum</i>	x	R (4 to 5 brkn)	
	<i>C. femorale</i>	x	U (frags)	
	<i>C. muricinum</i>		R (1 brkn)	
	<i>C. nicobaricum</i>	x	R (5)	
	<i>C. pileare</i>		R (1 frag)	x
	<i>C. labiosum</i>		R (2 brkn)	x
	<i>Charonia variegata</i>		R(1 frag)	
<b>BURSIDAE</b>				
	<i>Bursa cubaniana</i>	D30/2002	R (1)	x
<b>TONNIDAE</b>				
(tuns)	<i>Tonna maculosa</i>	x	R (4 or 5 small)	x
<b>MURICIDAE</b>				
(murexes)	<i>Phyllonotus pomum</i>	x	R (2 & frags)	
<b>THAIDIDAE</b>				
(dog winkles)	<i>Morula nodulosa</i>		R(1)	x
	<i>Thais deltoidea</i>	x	R (3 or 4)	
	<i>T. rustica</i>		R (3 or 4)	
<b>COLUMBELLIDAE</b>				
(dove shells)	<i>Columbella mercatoria</i>	x	A	x
	<i>Nitidella nitida</i>		R (3 or 4)	
	<i>Mitrella ocellata</i>		R (1 frag)	
	<i>Pyrene ovuloides</i>	x	A	x
<b>BUCCINIDAE</b>				
(whelks)	<i>Engoniophos</i> sp		U	x
	<i>Pisania pusio</i>	x	R(1 frag)	
	<i>P. auritula</i>	x	U	
	<i>P. tincta</i>		R (1 brkn)	
	<i>Engina turbinella</i>		R (1 tiny)	x

CLASS	Species	Collected 2000	Abundance	Specimen Collected
	<i>Bailya intricata</i> *		R (1 brkn)	x
<b>GASTROPODA</b>				
<b>FASCIOLARIIDAE</b>				
(tulips, etc.)	<i>Fasciolaria tulipa</i>	x	U	
	<i>Leucozonia nassa</i>	x	R (2 lrg & frags)	
	<i>L. ocellata</i>		R (1 & frags)	
	<i>Latirus angulatus</i>		R (2/1 whole)	x
	<i>L. infundibulum</i>		R (1 brkn)	
<b>OLIVIDAE</b>				
(olives)	<i>Oliva reticulatus</i>	x	U	x
	<i>Olivella nivea</i>	x	U	x
	<i>Jaspidella jaspidea</i>		R (2)	(x)
<b>MITRIDAE</b>				
(miters)	<i>Mitra nodulosa</i>	x	U	x
	<i>M. barbadensis</i>	x	U	x
	<i>M. sp. (white rings)</i>		R (3)	
	<i>Pursia sp. (white streaks)</i>		R (3 or 4)	
<b>HARPIDAE</b>				
(harp-shells)	<i>Morum oniscus</i>	x	C	(x)
<b>CANCELLARIADAE</b>				
(nutmegs)	<i>Tritonoharpa obscura</i>	only		
	<i>Trigonostoma rugosum</i>	x	v C	
<b>CONIDAE</b>				
(cones)	<i>Conus mus</i>	x	U	x
	<i>C. jaspideus</i>	x	C	x
	<i>C. regius</i>	x	R (3-4, 1 whole)	
	<i>C. daucus</i>		R (1 frag)	
<b>TEREBRIDAE</b>				
(augers)	<i>Terebra hastata</i>		R (2 old)	
<b>PYRAMIDELLIDAE</b>				
(pyrams)	<i>Pyramidella dolabrata</i>		R (2, 1 brkn)	x
<b>TURRIDAE</b>				
(turrids)	<i>Monilispira leucocmya(?)</i>		U (brkn)	
	<i>M. albomaculata</i>		R (2 or 3)	x
	<i>Crassispira sp(?)</i>		R (5 or 6)	
<b>BULLIDAE</b>				
(true bubble shells)	<i>Bulla striata</i>	x	A	x

<b>SCAPHOPODA</b>		<b>Collected</b>	<b>Abundance</b>	<b>Specimen</b>
	<b>Species</b>	<b>2000</b>		<b>Collected</b>
<b>DENTALIIDAE</b>				
	Dentalium eboreum		U	x
	scaphopod sp		U	x
<b>POLYPLACOPHORA</b>				
<b>CHITONIDAE</b>				
	Chiton tuberculata		R (4 or 5)	
<b>BIVALVIA</b>				
<b>ARCIDAE</b>				
(arks)	Arca zebra	x	C	x
	A. imbricata	x	C	
	Barbatia cancellaria	x	C	x
	B. candida		R (2 or 3)	x
	B. domingensis	x	U	
	Arcopsis adamsi	x	R (1 or 2)	
	Anadara notabilis	x	C	(x)
<b>GLYCIMERIDAE</b>				
(bittersweets)	Glycimeris pectinata	x	C	x
	G. decussata		R (2 old)	
<b>MYTILIDAE</b>				
(mussels)	Modiolus americanus	x	R (& frags)	x
	Brachidontes modiolus		U	x
	B. exustus (?)		U	x
<b>ISOGNOMONIDAE</b>				
(purse shells)	Isognomon alatus		R(2 or 3)	x
<b>PTERIIDAE</b>				
(pearl oysters)	Pteria colymbus		R (1 frag)	
	P. imbricata	only		
<b>PECTINIDAE</b>				
(scallops)	Caribachlamys ornata		R (3 old)	
<b>LIMIDAE</b>				
(file shells)	Lima pellucida	x	C	x
	L. scabra		R (1 worn)	
<b>SPONDYLIDAE</b>				
(spiny oysters)	Spondylus americanus	x	R (3 juv & old frag)	
<b>PLICATULIDAE</b>				
(kitten paws)	Plicatula gibbosa	x	R(3)	
<b>OSTREIDAE</b>				

(oysters) *Dendrostrea frons* R(3)

<b>CLASS</b>	<b>Species</b>	<b>Collected 2000</b>	<b>Abundance</b>	<b>Specimen Collected</b>
<b>BIVALVIA</b>				
<b>LUCINIDAE</b>				
(lucines)	<i>Linga pensylvanica</i>	x	C	x
	<i>Codakia orbicularis</i>	x	A	x
	<i>C. orbiculata</i>		U	x
	<i>C. costata</i>		U	(x)
	<i>Lucina pectinata*</i>	only		
<b>CHAMIDAE</b>				
(jewel-boxes)	<i>Chama sarda</i>	x		x
	<i>C. macerophylla/congregata</i>	x		
	<i>C. sinuosa</i>	x		x
	<i>Pseudochama radians</i>			
<b>CARDIIDAE</b>				
(cockles)	<i>Trachycardium isocardia</i>	x	U/C	
	<i>T. muricatum</i>	x	U/C	x
	<i>Americardia media</i>	x	C	x
	<i>Laevicardium laevigatum</i>	x	R(2)	
<b>VENERIDAE</b>				
(hard shelled clams)	<i>Periglypta listeri</i>	x	R(1)	
	<i>Chione cancellata</i>	x	U	(x)
	<i>C. paphia</i>	x	R(1)	
	<i>C. pygmaea</i>	x	C/A	x
	<i>Anomalocardia brasiliana</i>	x	A	(x)
	<i>Tivela floridana</i>		R (4 or 5)	(x)
	<i>Pitar simsoni</i>		R(3)	(x)
	<i>P. albidus</i>			
<b>MACTRIDAE</b>				
(surf clams)	<i>Mactra fragilis</i>	x	R(1 brkn)	
<b>TELLINIDAE</b>				
(tellins)	<i>Tellina radiata</i>	x	R(2)	x
	<i>T. listeri</i>	x	R(2)	
	<i>T. laevigata</i>	only		
	<i>Arcopagia fausta</i>	x	R(1)	
	<i>Strigilla carnaria</i>	x	U (frags)	x
	<i>Psammotreta intastriata</i>	only		
	<i>Macoma pseudomera</i>		R (5 o r6)	x
<b>SEMELIDAE</b>				
(semeles)	<i>Semele proficua</i>	x	R(1)	x
<b>CEPHALOPODA</b>				
	<i>Spirula spirula</i>			