

Annex G2

## Monitoring Results for Soft Shore Ecology

**Table G2.1 Results for Horseshoe Crabs during Qualitative Walk-through Surveys in December 2018**

Sighting #	Species	Prosomal Width (cm)	Total Length (cm)
<b>Monitoring Date: 4 December 2018 10:15-13:30</b>			
<b>Monitoring Station: THW</b>			
1	<i>Tachypleus tridentatus</i>	2.7	5.2
2	<i>Tachypleus tridentatus</i>	3.1	6.5
3	<i>Tachypleus tridentatus</i>	3.0	6.1
4	<i>Tachypleus tridentatus</i>	4.0	8.4
5	<i>Tachypleus tridentatus</i>	3.2	6.6
6	<i>Tachypleus tridentatus</i>	3.9	7.4
7	<i>Tachypleus tridentatus</i>	3.8	7.2
8	<i>Tachypleus tridentatus</i>	2.4	5.6
9	<i>Tachypleus tridentatus</i>	4.0	7.8
10	<i>Tachypleus tridentatus</i>	2.4	4.5
11	<i>Tachypleus tridentatus</i>	2.6	4.9
12	<i>Tachypleus tridentatus</i>	2.9	3.5
13	<i>Tachypleus tridentatus</i>	2.4	4.6
14	<i>Tachypleus tridentatus</i>	2.9	5.0
15	<i>Tachypleus tridentatus</i>	3.4	6.8
16	<i>Tachypleus tridentatus</i>	1.6	3.1
17	<i>Tachypleus tridentatus</i>	3.2	5.8
	<b>Mean (Range)</b>	<b>3.0 (1.6-4.0)</b>	<b>5.8 (3.1-8.4)</b>
<b>Monitoring Date: 5 December 2018 13:30-16:00</b>			
<b>Monitoring Station: TCB1</b>			
1	<i>Tachypleus tridentatus</i>	3.4	7.5
	<b>Mean (Range)</b>	<b>- (-)</b>	<b>- (-)</b>
<b>Monitoring Date: 5 December 2018 13:30-16:00</b>			
<b>Monitoring Station: TCB3</b>			
1	<i>Tachypleus tridentatus</i>	2.5	4.8
2	<i>Tachypleus tridentatus</i>	0.8	1.6
3	<i>Tachypleus tridentatus</i>	2.7	5.0
	<b>Mean (Range)</b>	<b>2.0 (0.8-2.7)</b>	<b>3.8 (1.6-5.0)</b>

**Table G2.2 Results for Other Intertidal Soft Shore Communities during Qualitative Walk-through Surveys in December 2018**

Monitoring Station	Shore Height *	No. of Species
TCB1	H	36
	M	34
	L	34
	<b>Overall</b>	<b>45</b>
TCB2	H	31
	M	34
	L	33
	<b>Overall</b>	<b>41</b>
TCB3	H	23
	M	25
	L	23
	<b>Overall</b>	<b>32</b>
THW	H	30
	M	27
	L	32
	<b>Overall</b>	<b>43</b>

\* H: +2mCD; M: +1.5mCD; L: +1mCD

**Table G2.3 Results for Other Intertidal Soft Shore Communities during Quantitative Transect Surveys in December 2018**

Monitoring Station	Shore Height *	Top Three Dominant Species	Density (ind./m <sup>2</sup> )
TCB1	H	1 <i>Cerithidea diadjariensis</i>	297.6
		2 <i>Batillaria multiformis</i>	80.8
		3 <i>Batillaria zonalis</i>	24.0
	M	1 <i>Cerithidea diadjariensis</i>	207.2
		2 <i>Batillaria zonalis</i>	92.8
		3 <i>Cerithidea cingulata</i>	63.2
	L	1 <i>Monodonta labio</i>	113.6
		2 <i>Batillaria zonalis</i>	77.6
		3 <i>Lunella coronata</i>	23.2
TCB2	H	1 <i>Monodonta labio</i>	54.4
		2 <i>Cellana grata</i>	5.6
		3 <i>Geloina erosa</i>	2.4
	M	1 <i>Cerithidea diadjariensis</i>	84.0
		2 <i>Batillaria zonalis</i>	32.0
		3 <i>Batillaria multiformis</i>	30.4
	L	1 <i>Batillaria zonalis</i>	47.2
		2 <i>Cerithidea diadjariensis</i>	10.4
		3 <i>Monodonta labio</i> / <i>Lunella coronata</i>	4.0
TCB3	H	1 <i>Batillaria multiformis</i>	1198.4
		2 <i>Batillaria zonalis</i>	57.6
		3 <i>Cerithidea cingulata</i>	33.6
	M	1 <i>Batillaria multiformis</i>	87.2
		2 <i>Monodonta labio</i>	9.6
		3 <i>Cellana grata</i>	4.8
	L	1 <i>Batillaria multiformis</i>	30.4
		2 <i>Lunella coronata</i>	8.0
		3 <i>Monodonta labio</i>	4.8
THW	H	1 <i>Cerithidea diadjariensis</i>	128.8
		2 <i>Batillaria multiformis</i>	98.4
		3 <i>Geloina erosa</i>	46.4
	M	1 <i>Cerithidea diadjariensis</i>	236.0
		2 <i>Batillaria zonalis</i>	59.2
		3 <i>Cerithidea cingulata</i>	48.0
	L	1 <i>Cerithidea diadjariensis</i>	151.2
		2 <i>Batillaria multiformis</i>	113.6
		3 <i>Cerithidea cingulata</i>	80.8

\* H: +2mCD; M: +1.5mCD; L: +1mCD

Group	Species	TCB1			TCB2			TCB3			THW		
		H	M	L	H	M	L	H	M	L	H	M	L
Barnacle	<i>Balanus amphitrite</i>	++	+	+	++	+	+	++	+	+	+	+	+
Bivalve	<i>Anomalocardia squamosa</i>			+		+	+						+
Bivalve	<i>Barbatia virescens</i>			+					+	+			
Bivalve	<i>Circe</i> sp.												+
Bivalve	<i>Coecella chinensis</i>			+									
Bivalve	<i>Corbula erythrodon</i>										+		
Bivalve	<i>Cyclina sinensis</i>											+	+
Bivalve	<i>Dosinia japonica</i>							+					
Bivalve	<i>Ervilia</i> sp.										+	+	+
Bivalve	<i>Geloina erosa</i>	+	+	+	+	+	+	+			++	+	+
Bivalve	<i>Gafrarium tumidum</i>					+							
Bivalve	<i>Hiatula diphos</i>										+	+	
Bivalve	<i>Laternula anatina</i>				+	+	+						
Bivalve	<i>Meretrix meretrix</i>												
Bivalve	<i>Sacostrea cucullata</i>	++	++	++	++	++	++	++	++	++	+	+	+
Bivalve	<i>Septifer virgatus</i>	+	+	+		+	+						
Bivalve	<i>Venerupis aspera</i>	+		+			+	+					
Bivalve	<i>Venerupis philippinarum</i>										+		
Chiton	<i>Acanthopleura japonica</i>			+									
Crab	<i>Clistocoeloma</i> sp.				+						+		
Crab	<i>Hemigrapsus sanguineus</i>	+	+		+	+	+	+	+		++	+	+
Crab	<i>Ilyoplax</i> spp.												+
Crab	<i>Macrophthalmus</i> sp.	+	+	+	+	+	+		+	+	+	+	+
Crab	<i>Metaplax longipes</i>												+
Crab	<i>Metapograpus frontalis</i>	+	+	+	+	+	+		+	+	+	+	+
Crab	<i>Parasesarma pictum</i>										+	+	
Crab	<i>Perisesarma bidens</i>	++	+		+	+	+		+		+	+	+
Crab	<i>Scopimera globosa</i>		+		+	++	+	+	+	+	+	+	+
Crab	<i>Uca borealis</i>	+	+	+		+		+				+	+
Crab	<i>Uca lactea</i>	++	++		++	++	++	++	++		++	++	++
Crab	<i>Uca paradussumieri</i>										+		
Crab	<i>Uca splendida</i>				+								
Crab	<i>Varuna litterata</i>											+	
Fish	<i>Terapon jarbua</i>	+			+	+					+	+	+
Fish	<i>Periophthalmus cantonensis</i>	+	+	+	++	++	+	+	+		+	+	+
Gastropod	<i>Batillaria multiformis</i>	++	+	+	++	++	++	++	++	++	++	++	++
Gastropod	<i>Batillaria zonalis</i>	+	++	++	+	+	+	+	+	+	++	++	++
Gastropod	<i>Cellana grata</i>	+	+	+	+	+	+	+	+	+	+		+
Gastropod	<i>Cerithidea cingulata</i>	+	+	+	+	+	+	+	+	+	++	++	++
Gastropod	<i>Cerithidea diadjariensis</i>	++	++	+	+	+	+				++	++	++
Gastropod	<i>Cerithidea microptera</i>			+	+						+	+	+
Gastropod	<i>Cerithidea rhizophorarum</i>		+										+
Gastropod	<i>Clithon</i> spp.	+	+	+	+		+	+	+	+	+	+	+
Gastropod	<i>Echinolittorina radiata</i>						+						
Gastropod	<i>Echinolittorina malaccana</i>										+		
Gastropod	<i>Littoraria articulata</i>	++	+	+	++	+	+	++	+	+	+		
Gastropod	<i>Littoraria melanostoma</i>	+			+	+	+	+	+		+		
Gastropod	<i>Lunella coronata</i>	+	+	+		+	+	+	+	+			
Gastropod	<i>Monodonta labio</i>	++	++	++	++	+	+	+	++	+			
Gastropod	<i>Nassarius festivus</i>	+	+	+	+	+	+		+	+	+	+	+
Gastropod	<i>Nerita polita</i>	+	+	+	+	+	+	+	+	+		+	+
Gastropod	<i>Nipponacmea concinna</i>		+	+									
Gastropod	<i>Patelloida pygmaea</i>	+	+										
Gastropod	<i>Peasiella</i> spp.						+						
Gastropod	<i>Planaxis sulcatus</i>	+	+		+	+					+	+	
Gastropod	<i>Terebralia palustris</i>											+	
Gastropod	<i>Terebralia sulcata</i>	+	+	+	+	+	+	+	+	+			
Gastropod	<i>Thais clavigera</i>			+									
Hermit Crab	<i>Clibanarius</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
Horseshoe Crab	<i>Carcinoscorpius rotundicauda</i>	+				+							
Horseshoe Crab	<i>Tachyplesus tridentatus</i>	+	+	+					+	+		+	+
Sea Slater	<i>Ligia oceanica</i>	+			+	+						+	+
Seaslug	<i>Onchidium</i> sp.	+	+	+							+		
Worm	<i>Ceratonereis</i> sp.	+	+	+									
Worm	<i>Echiura</i> spp.												+
Worm	<i>Oligochaete</i> sp.	+	+	+	+	+	+						+
Worm	<i>Sipunculus</i> sp.	+	+	+	+	+	+		+	+	+		
Worm	Ribbon Worm sp.			+			+						

Remark: '+' denotes the species was relatively rare at the area;  
 '++' denotes the species was relatively abundant at the area.

Group	Species	TCB1																		
		H1	H2	H3	H4	H5	Density (ind. / m <sup>2</sup> or % cover)	M1	M2	M3	M4	M5	Density (ind. / m <sup>2</sup> or % cover)	L1	L2	L3	L4	L5	Density (ind. / m <sup>2</sup> or % cover)	
Barnacle	<i>Balanus amphitrite</i>								<5%					<5%	<5%					<5%
Bivalve	<i>Anomalocardia squamosa</i>																			
Bivalve	<i>Barbatia virescens</i>																			
Bivalve	<i>Coecella chinensis</i>														1					0.8
Bivalve	<i>Corbula erythrodon</i>																			
Bivalve	<i>Cyclina sinensis</i>																			
Bivalve	<i>Donax</i> sp.																			
Bivalve	<i>Dosinia japonica</i>																			
Bivalve	<i>Ervilia</i> sp.							1					0.8							
Bivalve	<i>Geloina erosa</i>				2	1	2.4	2		1		2.4		1						0.8
Bivalve	<i>Saccostrea cucullata</i>				<5%		<5%	<5%	20%	<5%	<5%	5%	<5%	10%	20%	15%	<5%			10%
Bivalve	<i>Septifer virgatus</i>							<5%	<5%					<5%		<5%			<5%	<5%
Bivalve	<i>Venerupis aspera</i>																			
Bivalve	<i>Venerupis philippinarum</i>																			
Crab	<i>Clistocoeloma</i> sp.																			
Crab	<i>Eriphia</i> sp.													1						0.8
Crab	<i>Macrophthalmus</i> sp.																			
Crab	<i>Metapograpsus frontalis</i>													2						1.6
Crab	<i>Scopimera globosa</i>																			
Crab	<i>Uca lactea</i>																			
Gastropod	<i>Batillaria multiformis</i>	15	12		3	71	80.8	2	1	7	2	14	20.8		22	1				18.4
Gastropod	<i>Batillaria zonalis</i>	10	4	16			24.0	18	29	36	9	24	92.8		2	15	26	54		77.6
Gastropod	<i>Cellana grata</i>							1		1	1		2.4	17		5				17.6
Gastropod	<i>Cerithidea cingulata</i>	2	1	7			8.0	14	23	25		17	63.2		12					9.6
Gastropod	<i>Cerithidea diadjariensis</i>	22	131	113	59	47	297.6	29	78	54	4	94	207.2		8	13	1	2		19.2
Gastropod	<i>Cerithidea rhizophorarum</i>																			
Gastropod	<i>Clithon</i> spp.		1					6	1	4		5	12.8							
Gastropod	<i>Echinolittorina radiata</i>										2		1.6							
Gastropod	<i>Littoraria articulata</i>																			
Gastropod	<i>Lunella coronata</i>				1		0.8	1		3		1	4.0	22		7				23.2
Gastropod	<i>Monodonta labio</i>		14		3	12	23.2	5	1	5	31	4	36.8	71	6	65				113.6
Gastropod	<i>Nassarius festivus</i>							1	1	1			2.4	1			1	1		2.4
Gastropod	<i>Nerita polita</i>					2	1.6							2		1				2.4
Gastropod	<i>Nipponacmea concinna</i>									1			0.8							
Gastropod	<i>Patelloida pygmaea</i>					1	0.8													
Gastropod	<i>Terebralia sulcata</i>																			
Gastropod	<i>Thais clavigera</i>													2						1.6
Hermit Crab	<i>Clibanarius</i> sp.																		1	0.8
Worm	<i>Oligochaete</i> sp.			1			0.8	2			1	1	3.2	3		1	4			6.4
Worm	<i>Sipunculus</i> sp.				1		0.8	2		1			2.4	4	2	3	1			8.0
Worm	Ribbon Worm sp.																			

Group	Species	TCB2																		
		H1	H2	H3	H4	H5	Density (ind./m <sup>2</sup> or % cover)	M1	M2	M3	M4	M5	Density (ind./m <sup>2</sup> or % cover)	L1	L2	L3	L4	L5	Density (ind./m <sup>2</sup> or % cover)	
Barnacle	<i>Balanus amphitrite</i>																			
Bivalve	<i>Anomalocardia squamosa</i>											1	0.8							
Bivalve	<i>Barbatia virescens</i>																			
Bivalve	<i>Coecella chinensis</i>																			
Bivalve	<i>Corbula erythrodon</i>																			
Bivalve	<i>Cyclina sinensis</i>																			
Bivalve	<i>Donax</i> sp.																			
Bivalve	<i>Dosinia japonica</i>																			
Bivalve	<i>Ervilia</i> sp.																			
Bivalve	<i>Geloina erosa</i>		3				2.4													
Bivalve	<i>Saccostrea cucullata</i>	10%	10%	20%		10%	10%		<5%	20%	10%	<5%	6%	10%	<5%	<5%		<5%	<5%	
Bivalve	<i>Septifer virgatus</i>										<5%		<5%							
Bivalve	<i>Venerupis aspera</i>																			
Bivalve	<i>Venerupis philippinarum</i>																			
Crab	<i>Clistocoeloma</i> sp.																			
Crab	<i>Eriphia</i> sp.																			
Crab	<i>Macrophthalmus</i> sp.																			
Crab	<i>Metapograpsus frontalis</i>																			
Crab	<i>Scopimera globosa</i>																			
Crab	<i>Uca lactea</i>																			
Gastropod	<i>Batillaria multiformis</i>		2				1.6					38	30.4							
Gastropod	<i>Batillaria zonalis</i>							13		6	8	13	32.0	6		2	12	39		47.2
Gastropod	<i>Cellana grata</i>	2		3		2	5.6													
Gastropod	<i>Cerithidea cingulata</i>							2				20	17.6							
Gastropod	<i>Cerithidea diadjariensis</i>							30	24	39	12		84.0	8	4			1		10.4
Gastropod	<i>Cerithidea rhizophorarum</i>													1						0.8
Gastropod	<i>Clithon</i> spp.																			
Gastropod	<i>Echinolittorina radiata</i>																			
Gastropod	<i>Littoraria articulata</i>																			
Gastropod	<i>Lunella coronata</i>							2			1		2.4		1			4		4.0
Gastropod	<i>Monodonta labio</i>	10		29	13	16	54.4								5					4.0
Gastropod	<i>Nassarius festivus</i>							1					0.8		1					0.8
Gastropod	<i>Nerita polita</i>																			
Gastropod	<i>Nipponacmea concinna</i>																			
Gastropod	<i>Patelloida pygmaea</i>																			
Gastropod	<i>Terebralia sulcata</i>																			
Gastropod	<i>Thais clavigera</i>																			
Hermit Crab	<i>Clibanarius</i> sp.																			
Worm	<i>Oligochaete</i> sp.																			
Worm	<i>Sipunculus</i> sp.														1					0.8
Worm	Ribbon Worm sp.																			

Group	Species	TCB3																			
		H1	H2	H3	H4	H5	Density (ind. / m <sup>2</sup> or % cover)	M1	M2	M3	M4	M5	Density (ind. / m <sup>2</sup> or % cover)	L1	L2	L3	L4	L5	Density (ind. / m <sup>2</sup> or % cover)		
Barnacle	<i>Balanus amphitrite</i>																			<5%	<5%
Bivalve	<i>Anomalocardia squamosa</i>																				
Bivalve	<i>Barbatia virescens</i>										1		0.8	1							0.8
Bivalve	<i>Coecella chinensis</i>																				
Bivalve	<i>Corbula erythrodon</i>																2				1.6
Bivalve	<i>Cyclina sinensis</i>																				
Bivalve	<i>Donax sp.</i>																				
Bivalve	<i>Dosinia japonica</i>	3	1		2		4.8														
Bivalve	<i>Ervilia sp.</i>														1	1			1		2.4
Bivalve	<i>Geloina erosa</i>	1		4	1		4.8														
Bivalve	<i>Saccostrea cucullata</i>	<5%	<5%	<5%			<5%	<5%	<5%	<5%	10%	<5%	<5%	30%	<5%	10%	5%	5%		10%	
Bivalve	<i>Septifer virgatus</i>																				
Bivalve	<i>Venerupis aspera</i>			1			4.0														
Bivalve	<i>Venerupis philippinarum</i>																	1			0.8
Crab	<i>Clistocoeloma sp.</i>																				
Crab	<i>Eriphia sp.</i>																				
Crab	<i>Macrophthalmus sp.</i>																	1	1		1.6
Crab	<i>Metapograpsus frontalis</i>																				
Crab	<i>Scopimera globosa</i>							1		1	1		2.4	1			2	1			3.2
Crab	<i>Uca lactea</i>																				
Gastropod	<i>Batillaria multiformis</i>	658	202	361	101	176	1198.4	75	2	3	13	16	87.2	16	4	5			13	30.4	
Gastropod	<i>Batillaria zonalis</i>	8	8	10	18	28	57.6	3		2			4.0								
Gastropod	<i>Cellana grata</i>					1	0.8			1	5		4.8								
Gastropod	<i>Cerithidea cingulata</i>	8	28	6			33.6				1		0.8								
Gastropod	<i>Cerithidea diadjariensis</i>		3				2.4														
Gastropod	<i>Cerithidea rhizophorarum</i>																				
Gastropod	<i>Clithon spp.</i>	1					0.8			1			0.8	1		1					1.6
Gastropod	<i>Echinolittorina radiata</i>																				
Gastropod	<i>Littoraria articulata</i>										1		0.8	5							
Gastropod	<i>Lunella coronata</i>	1					0.8			3	1		3.2	2	2	3			3	8.0	
Gastropod	<i>Monodonta labio</i>					1	0.8	4			5	3	9.6	2	1	1	1	1			4.8
Gastropod	<i>Nassarius festivus</i>																	1			0.8
Gastropod	<i>Nerita polita</i>		1	1			1.6														
Gastropod	<i>Nipponacmea concinna</i>																				
Gastropod	<i>Patelloida pygmaea</i>																				
Gastropod	<i>Terebralia sulcata</i>																				
Gastropod	<i>Thais clavigera</i>																				
Hermit Crab	<i>Clibanarius sp.</i>																3				2.4
Worm	<i>Oligochaete sp.</i>																				
Worm	<i>Sipunculus sp.</i>							1	1				1.6								
Worm	Ribbon Worm sp.																				



Group	Species	THW																		
		H1	H2	H3	H4	H5	Density (ind. / m <sup>2</sup> or % cover)	M1	M2	M3	M4	M5	Density (ind. / m <sup>2</sup> or % cover)	L1	L2	L3	L4	L5	Density (ind. / m <sup>2</sup> or % cover)	
Barnacle	<i>Balanus amphitrite</i>																			<5%
Bivalve	<i>Anomalocardia squamosa</i>																			
Bivalve	<i>Barbatia virescens</i>																			
Bivalve	<i>Coecella chinensis</i>			1	1		1.6											1		0.8
Bivalve	<i>Corbula erythrodon</i>																			
Bivalve	<i>Cyclina sinensis</i>		1								1	2	2.4							
Bivalve	<i>Donax</i> sp.													3	2	2	2	1		8.0
Bivalve	<i>Dosinia japonica</i>																			
Bivalve	<i>Ervilia</i> sp.																			
Bivalve	<i>Geloina erosa</i>	17	10	8	9	14	46.4	3	5	2	1	8.8								
Bivalve	<i>Saccostrea cucullata</i>						<5%													
Bivalve	<i>Septifer virgatus</i>																			
Bivalve	<i>Venerupis aspera</i>																			
Bivalve	<i>Venerupis philippinarum</i>																			
Crab	<i>Clistocoeloma</i> sp.			1			0.8													
Crab	<i>Eriphia</i> sp.																			
Crab	<i>Macrophthalmus</i> sp.																			
Crab	<i>Metapograpus frontalis</i>																			
Crab	<i>Scopimera globosa</i>				1		0.8													
Crab	<i>Uca lactea</i>					1	0.8													
Gastropod	<i>Batillaria multiformis</i>		3	1	114	5	98.4		4	1	30	12	37.6	11	8	1	80	42	113.6	
Gastropod	<i>Batillaria zonalis</i>				4	31	28.0	19	16	32	2	5	59.2	40		38	4	7	71.2	
Gastropod	<i>Cellana grata</i>																			
Gastropod	<i>Cerithidea cingulata</i>				9	24	26.4	17	9	9	12	13	48.0	13	44	14	26	4	80.8	
Gastropod	<i>Cerithidea diadjariensis</i>	26	46	6	35	48	128.8	80	41	12	59	103	236.0	94		71		24	151.2	
Gastropod	<i>Cerithidea rhizophorarum</i>																8			6.4
Gastropod	<i>Clithon</i> spp.								1				0.8		1	3				3.2
Gastropod	<i>Echinolittorina radiata</i>																			
Gastropod	<i>Littoraria articulata</i>																			
Gastropod	<i>Lunella coronata</i>																			
Gastropod	<i>Monodonta labio</i>																			
Gastropod	<i>Nassarius festivus</i>		2			1	2.4	2	41	12			44.0			5			4.0	
Gastropod	<i>Nerita polita</i>														1		1			1.6
Gastropod	<i>Nipponacmea concinna</i>																			
Gastropod	<i>Patelloida pygmaea</i>																			
Gastropod	<i>Terebralia sulcata</i>	1		1			1.6		1				0.8							
Gastropod	<i>Thais clavigera</i>																			
Hermit Crab	<i>Clibanarius</i> sp.																			
Worm	<i>Oligochaete</i> sp.																			
Worm	<i>Sipunculus</i> sp.																			
Worm	Ribbon Worm sp.				1		0.8													