

### **Appendix 9: Population Pairwise $F_{st}$**

<i>Patiria pectinifera</i>	AS	FU	OO
<b>B202</b>			
Asamusi Bay	0.00	-	
Futagojima	0.01	0.00	
Ooura Japan	<b>0.23</b>	<b>0.24</b>	0.00
<b>C113</b>			
Asamusi Bay	0.00	-	
Futagojima	0.03	0.00	
Ooura Japan	0.05	0.02	0.00
<b>C8</b>			
Asamusi Bay	0.00	-	
Futagojima	0.01	0.00	
Ooura Japan	0.00	0.01	0.00
<b>B201</b>			
Asamusi Bay	0.00	-	
Futagojima	0.11	0.00	
Ooura Japan	<b>0.19</b>	<b>0.51</b>	0.00
<b>Overall</b>			
Asamusi Bay	0.00	-	
Futagojima	0.02	0.00	
Ooura Japan	<b>0.09</b>	<b>0.17</b>	0.00

<i>Meridiastra mortenseni</i>	KA	MB	WA
<b>b202</b>			
Karaka Bay	0.00	-	
Mission Bay	<b>0.32</b>	0.00	
Whangarei	<b>0.23</b>	0.03	0.00
<b>c232</b>			
Karaka Bay	0.00	-	
Mission Bay	<b>0.11</b>	0.00	
Whangarei	0.05	0.03	0.00
<b>c114</b>			
Karaka Bay	0.00	-	
Mission Bay	0.05	0.00	
Whangarei	0.02	0.08	0.00
<b>c112</b>			
Karaka Bay	0.00	-	
Mission Bay	0.05	0.00	
Whangarei	0.08	0.04	0.00
<b>c204a</b>			
Karaka Bay	0.00	-	

Mission Bay	<b>0.24</b>	0.00										
Whangarei	0.09	<b>0.38</b>	0.00									
<b>Overall</b>	KA	MB	WA									
Karaka Bay	0.00											
Mission Bay	<b>0.11</b>	0.00										
Whangarei	<b>0.07</b>	0.06	0.00									

<i>Meridiastra calcar</i>	Sh1	LB	EN	BM	CL	DY	PS	AB	FB	GB	PS1	ALA	ALB
<b>b202</b>													
Shell Harbour 1	0.00												
Little Bay	0.01	0.00											
Eaglehawk Neck	0.03	0.02	0.00										
Balmaural	0.02	0.00	0.06	0.00									
Clovelley	0.01	0.01	0.01	0.03	0.00								
Deewhy	0.02	0.00	0.06	0.02	0.02	0.00							
Primrose Sands	0.00	0.05	0.11	0.00	0.08	0.00	0.00						
Allison Bay	0.16	0.23	0.24	0.19	0.25	0.18	0.09	0.00					
Fortescue Bay	0.08	0.13	0.25	0.04	0.19	0.05	0.02	0.24	0.00				
Gordons Bay	0.08	0.05	0.01	0.12	0.02	0.11	<b>0.18</b>	<b>0.32</b>	<b>0.33</b>	0.00			
Port Stevens	<b>0.94</b>	<b>0.96</b>	<b>0.96</b>	<b>0.95</b>	<b>0.96</b>	<b>0.94</b>	<b>0.89</b>	<b>0.70</b>	<b>0.94</b>	<b>0.97</b>	0.00		
West B	0.02	0.00	0.04	0.01	0.02	0.02	0.00	0.14	0.08	0.10	<b>0.93</b>	0.00	
West A	0.02	0.01	0.08	0.02	0.04	0.02	0.02	0.12	0.04	0.14	<b>0.92</b>	0.02	0.00
<b>b236</b>													
Shell Harbour 1	0.00												
Little Bay	0.06	0.00											
Eaglehawk Neck	<b>0.71</b>	<b>0.86</b>	0.00										
Balmaural	<b>0.93</b>	<b>0.99</b>	<b>0.38</b>	0.00									
Clovelley	0.05	<b>0.23</b>	<b>0.50</b>	<b>0.80</b>	0.00								
Deewhy	0.05	0.23	<b>0.50</b>	<b>0.81</b>	0.04	0.00							
Primrose Sands	<b>0.92</b>	<b>0.99</b>	<b>0.20</b>	0.06	<b>0.76</b>	<b>0.77</b>	0.00						
Allison Bay	0.48	<b>0.68</b>	0.05	<b>0.42</b>	0.23	0.22	<b>0.31</b>	0.00					
Fortescue Bay	0.05	<b>0.26</b>	<b>0.45</b>	<b>0.83</b>	0.00	0.01	<b>0.78</b>	0.23	0.00				
Gordons Bay	0.27	<b>0.49</b>	0.20	<b>0.58</b>	0.07	0.06	<b>0.51</b>	0.00	0.07	0.00			
Port Stevens	0.02	0.02	<b>0.76</b>	<b>0.95</b>	0.09	0.08	<b>0.94</b>	<b>0.53</b>	0.11	0.33	0.00		
West B	<b>0.94</b>	<b>0.99</b>	<b>0.34</b>	0.01	<b>0.80</b>	<b>0.81</b>	0.03	<b>0.41</b>	<b>0.82</b>	<b>0.58</b>	<b>0.95</b>	0.00	
West A	<b>0.94</b>	<b>0.99</b>	<b>0.34</b>	0.01	<b>0.80</b>	<b>0.81</b>	0.02	<b>0.41</b>	<b>0.83</b>	<b>0.58</b>	<b>0.95</b>	0.00	0.00
<b>c232</b>													
Shell Harbour 1	0.00												
Little Bay	0.01	0.00											
Eaglehawk Neck	<b>0.43</b>	0.18	0.00										
Balmaural	0.03	0.03	<b>0.35</b>	0.00									
Clovelley	0.01	0.03	<b>0.31</b>	0.03	0.00								



Clovelley	0.01	0.00	0.01	0.01	0.00	-	-	-	-	-	-	-	-
Deewhy	0.01	0.00	0.01	0.01	0.01	0.00	-	-	-	-	-	-	-
Primrose Sands	0.03	0.02	0.00	0.07	0.04	0.02	0.00	-	-	-	-	-	-
Allison Bay	0.00	0.00	0.01	0.01	0.01	0.00	-	-	-	-	-	-	-
Fortescue Bay	0.00	0.01	0.01	0.02	0.00	0.01	0.01	0.00	0.00	-	-	-	-
Gordons Bay	0.00	0.01	0.00	0.01	0.00	0.01	0.02	0.00	0.01	0.00	-	-	-
Port Stevens	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.00	-
West B	0.01	0.00	0.01	0.04	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
West A	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.00	0.00
<b>c204a</b>													
Shell Harbour 1	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Little Bay	0.07	0.00	-	-	-	-	-	-	-	-	-	-	-
Eaglehawk Neck	0.17	<b>0.33</b>	0.00	-	-	-	-	-	-	-	-	-	-
Balmaural	0.04	0.01	0.19	0.00	-	-	-	-	-	-	-	-	-
Clovelley	0.00	0.03	0.13	0.03	0.00	-	-	-	-	-	-	-	-
Deewhy	0.12	<b>0.25</b>	0.04	0.11	0.08	0.00	-	-	-	-	-	-	-
Primrose Sands	0.24	<b>0.33</b>	0.06	0.17	0.17	0.07	0.00	-	-	-	-	-	-
Allison Bay	0.03	0.02	<b>0.27</b>	0.02	0.00	<b>0.22</b>	<b>0.28</b>	0.00	-	-	-	-	-
Fortescue Bay	0.01	0.11	0.08	0.03	0.03	0.15	0.12	0.07	0.00	-	-	-	-
Gordons Bay	0.06	0.02	<b>0.29</b>	0.02	0.01	<b>0.22</b>	0.30	0.02	0.07	0.00	-	-	-
Port Stevens	0.12	0.00	<b>0.32</b>	0.01	0.04	<b>0.28</b>	<b>0.30</b>	0.00	0.14	0.00	0.00	-	-
West B	<b>0.61</b>	<b>0.69</b>	0.12	<b>0.59</b>	<b>0.55</b>	<b>0.45</b>	0.20	<b>0.66</b>	0.52	<b>0.66</b>	<b>0.63</b>	0.00	-
West A	<b>0.50</b>	<b>0.62</b>	0.01	<b>0.49</b>	0.46	0.35	0.06	<b>0.57</b>	0.32	<b>0.58</b>	<b>0.57</b>	0.09	0.00
<b>Overall</b>	Sh1	LB	EN	BM	CL	DY	PS	AB	FB	GB	PS1	ALA	ALB
Shell Harbour 1	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Little Bay	<b>0.27</b>	0.00	-	-	-	-	-	-	-	-	-	-	-
Eaglehawk Neck	<b>0.25</b>	<b>0.41</b>	0.00	-	-	-	-	-	-	-	-	-	-
Balmaural	<b>0.38</b>	<b>0.61</b>	<b>0.23</b>	0.00	-	-	-	-	-	-	-	-	-
Clovelley	<b>0.11</b>	<b>0.22</b>	<b>0.18</b>	<b>0.42</b>	0.00	-	-	-	-	-	-	-	-
Deewhy	0.01	<b>0.30</b>	<b>0.18</b>	<b>0.32</b>	<b>0.10</b>	0.00	-	-	-	-	-	-	-
Primrose Sands	<b>0.28</b>	<b>0.55</b>	<b>0.12</b>	<b>0.11</b>	<b>0.30</b>	<b>0.18</b>	0.00	-	-	-	-	-	-
Allison Bay	<b>0.36</b>	<b>0.38</b>	<b>0.23</b>	<b>0.47</b>	<b>0.12</b>	<b>0.35</b>	<b>0.36</b>	0.00	-	-	-	-	-
Fortescue Bay	<b>0.27</b>	<b>0.31</b>	<b>0.22</b>	<b>0.45</b>	<b>0.13</b>	<b>0.28</b>	<b>0.39</b>	<b>0.15</b>	0.00	-	-	-	-
Gordons Bay	<b>0.12</b>	<b>0.26</b>	<b>0.13</b>	<b>0.32</b>	0.01	<b>0.12</b>	<b>0.23</b>	<b>0.12</b>	<b>0.16</b>	0.00	-	-	-
Port Stevens	<b>0.44</b>	<b>0.45</b>	<b>0.51</b>	<b>0.67</b>	<b>0.35</b>	<b>0.46</b>	<b>0.59</b>	<b>0.25</b>	<b>0.33</b>	<b>0.40</b>	0.00	-	-
West B	<b>0.38</b>	<b>0.64</b>	<b>0.20</b>	<b>0.22</b>	<b>0.40</b>	<b>0.27</b>	0.05	<b>0.48</b>	<b>0.49</b>	<b>0.34</b>	<b>0.68</b>	0.00	-
West A	<b>0.41</b>	<b>0.66</b>	<b>0.25</b>	<b>0.22</b>	<b>0.44</b>	<b>0.31</b>	<b>0.07</b>	<b>0.51</b>	<b>0.52</b>	<b>0.37</b>	<b>0.70</b>	0.02	0.00
<i>Cryptasterina hysteria</i>	OTI2	OTI1	OTI4	SY	SB	OTI5	-	-	-	-	-	-	-

**A102**

One Tree 2      0.00

One Tree 1	0.00	0.00				
One Tree 4	0.00	0.00	0.00			
South Yeppoon	0.00	0.00	0.00	0.00		
Statute Bay	0.00	0.00	0.00	0.00	0.00	
One Tree 5 2t	0.00	0.00	0.00	0.00	0.00	0.00
<b>B202</b>						
One Tree 2	0.00					
One Tree 1	0.00	0.00				
One Tree 4	0.00	0.00	0.00			
South Yeppoon	0.00	0.00	0.00	0.00		
Statute Bay	0.00	0.00	0.00	0.00	0.00	
One Tree 5 2t	0.00	0.00	0.00	0.00	0.00	0.00
<b>B227</b>						
One Tree 2	0.00					
One Tree 1	<b>1.00</b>	0.00				
One Tree 4	0.00	<b>1.00</b>	0.00			
South Yeppoon	0.00	<b>1.00</b>	0.00	0.00		
Statute Bay	<b>1.00</b>	0.00	<b>1.00</b>	<b>1.00</b>	0.00	
One Tree 5 2t	<b>1.00</b>	0.00	<b>1.00</b>	<b>1.00</b>	0.00	0.00
<b>c219</b>						
One Tree 2	0.00					
One Tree 1	0.00	0.00				
One Tree 4	0.00	0.00	0.00			
South Yeppoon	0.00	0.00	0.00	0.00		
Statute Bay	0.00	0.00	0.00	0.00	0.00	
One Tree 5 2t	0.00	0.00	0.00	0.00	0.00	0.00
<b>D8</b>						
One Tree 2	0.00					
One Tree 1	0.00	0.00				
One Tree 4	0.00	0.00	0.00			
South Yeppoon	0.00	0.00	0.00	0.00		
Statute Bay	0.00	0.00	0.00	0.00	0.00	
One Tree 5 2t	0.00	0.00	0.00	0.00	0.00	0.00
<b>Overall</b>	OTI2	OTI1	OTI4	SY	SB	OTI5
One Tree 2	0.00					
One Tree 1	<b>1.00</b>	0.00				
One Tree 4	0.00	<b>1.00</b>	0.00			
South Yeppoon	0.00	<b>1.00</b>	0.00	0.00		
Statute Bay	<b>1.00</b>	0.00	<b>1.00</b>	<b>1.00</b>	0.00	
One Tree 5 2t	<b>1.00</b>	0.00	<b>1.00</b>	<b>1.00</b>	0.00	0.00

<i>Cryptasterina pentagona</i>	AB2	AB1	BB	BO	TV	DB
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<b>a108</b>						
Arlie Beach 2	0.00					
Arlie Beach 1	<b>0.97</b>	0.00				
Bingal Bay	<b>0.97</b>	-	0.00			

		0.02					
Bowen		-	0.02	0.97	0.97	0.00	
Townsville		-	0.02	<b>0.96</b>	<b>0.96</b>	0.02	0.00
Dingo Beach		<b>0.13</b>	<b>1.00</b>	<b>1.00</b>	<b>0.07</b>	0.09	0.00
<b>b202</b>							
Arlie Beach 2			0.00				
Arlie Beach 1			0.00	0.00			
Bingal Bay			0.00	0.00	0.00		
Bowen		-	0.01	0.00	0.00	0.00	
Townsville		-	0.03	0.01	0.01	0.01	0.00
Dingo Beach		-	0.00	0.00	0.00	0.00	0.01
<b>b227</b>							
Arlie Beach 2			0.00				
Arlie Beach 1		<b>0.43</b>	0.00				
Bingal Bay		<b>0.40</b>	0.03	0.00			
Bowen		-	0.04	<b>0.36</b>	<b>0.33</b>	0.00	
Townsville		-	0.19	<b>0.58</b>	<b>0.59</b>	0.15	0.00
Dingo Beach		-	<b>0.31</b>	<b>0.42</b>	<b>0.46</b>	<b>0.24</b>	0.01
<b>b231</b>							
Arlie Beach 2			0.00				
Arlie Beach 1		<b>0.55</b>	0.00				
Bingal Bay		-	0.02	<b>0.82</b>	0.00		
Bowen		-	0.01	<b>0.85</b>	0.02	0.00	
Townsville		-	<b>0.23</b>	<b>0.30</b>	<b>0.46</b>	<b>0.51</b>	0.00
Dingo Beach		-	0.03	<b>0.81</b>	0.03	0.02	<b>0.44</b>
<b>c219</b>							
Arlie Beach 2			0.00				
Arlie Beach 1			0.00	0.00			
Bingal Bay			0.00	0.00	0.00		
Bowen			0.00	0.00	0.00	0.00	
Townsville			0.00	0.00	0.00	0.00	0.00
Dingo Beach			0.00	0.00	0.00	0.00	0.00
<b>overall</b>		AB2	AB1	BB	BO	TV	DB
Arlie Beach 2		0.00					
Arlie Beach 1		<b>0.51</b>	0.00				
Bingal Bay		<b>0.44</b>	<b>0.26</b>	0.00			
Bowen		<b>0.38</b>	<b>0.34</b>	<b>0.07</b>	0.00		
Townsville		<b>0.07</b>	<b>0.51</b>	<b>0.54</b>	<b>0.50</b>	0.00	
Dingo Beach		<b>0.07</b>	<b>0.66</b>	<b>0.58</b>	<b>0.54</b>	<b>0.11</b>	0.00

<i>Parvulastra exigua</i>	PS	SH1	CL	EN	DY	LB	PS	TK	SH2	BM	PH
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**c219**

Primrose Sands 0.00



Port Hughes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>a110</b>												
Primrose Sands	0.00											
Sh. Harbour 1	<b>0.89</b>	0.00										
Clovelley	<b>0.94</b>	0.04	0.00									
Eaglehawk Neck	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.00								
Deewhy	<b>0.94</b>	0.04	0.00	<b>1.00</b>	0.00							
Little Bay	<b>0.94</b>	0.05	0.00	<b>1.00</b>	0.00	0.00						
Port Stevens	<b>0.93</b>	0.03	0.00	<b>1.00</b>	0.00	0.00	0.00					
Tikera	0.17	<b>0.99</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.00				
Sh. Harbour 2	<b>0.93</b>	0.03	0.00	<b>1.00</b>	0.00	0.00	0.00	<b>1.00</b>	0.00			
Balmarual	<b>0.25</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.00	<b>1.00</b>	0.00		
Port Hughes	<b>0.92</b>	0.02	0.00	<b>1.00</b>	0.00	0.00	0.00	<b>1.00</b>	0.00	<b>1.00</b>	0.00	
<b>overall</b>	PS	SH1	CL	EN	DY	LB	PS	TK	SH2	BM	PH	
Primrose Sands	0.00											
Sh. Harbour 1	<b>0.80</b>	0.00										
Clovelley	<b>0.87</b>	<b>0.26</b>	0.00									
Eaglehawk Neck	<b>0.84</b>	<b>0.69</b>	<b>0.84</b>	0.00								
Deewhy	<b>0.80</b>	<b>0.19</b>	<b>0.28</b>	<b>0.74</b>	0.00							
Little Bay	<b>0.88</b>	<b>0.32</b>	<b>0.07</b>	<b>0.86</b>	<b>0.38</b>	0.00						
Port Stevens	<b>0.90</b>	<b>0.42</b>	<b>0.16</b>	<b>0.91</b>	<b>0.52</b>	<b>0.06</b>	0.00					
Tikera	<b>0.91</b>	<b>0.90</b>	<b>0.95</b>	<b>0.94</b>	<b>0.91</b>	<b>0.95</b>	<b>0.99</b>	0.00				
Sh. Harbour 2	<b>0.81</b>	<b>0.14</b>	<b>0.37</b>	<b>0.72</b>	<b>0.14</b>	<b>0.49</b>	<b>0.60</b>	<b>0.91</b>	0.00			
Balmarual	<b>0.77</b>	<b>0.69</b>	<b>0.76</b>	<b>0.81</b>	<b>0.74</b>	<b>0.77</b>	<b>0.82</b>	<b>0.85</b>	<b>0.76</b>	0.00		
Port Hughes	<b>0.95</b>	<b>0.83</b>	<b>0.90</b>	<b>0.95</b>	<b>0.82</b>	<b>0.91</b>	<b>0.99</b>	<b>0.90</b>	<b>0.83</b>	<b>0.94</b>	0.00	

<i>Parvulastra parvivipara</i>	CED	PB	TGR	SMP
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**c212**

Ceduna	0.00			
Point Brown	0.01	0.00		
The Granites	0.06	0.00	0.00	
Smooth Pool	<b>1.00</b>	<b>1.00</b>	<b>0.98</b>	0.00

**c104**

Ceduna	0.00			
Point Brown	0.00	0.00		
The Granites	0.00	0.00	0.00	
Smooth Pool	0.00	0.00	0.00	0.00

**b202**

Ceduna	0.00			
Point Brown	0.00	0.00		
The Granites	0.00	0.00	0.00	
Smooth Pool	0.00	0.00	0.00	0.00

**a110**

Ceduna	0.00			
Point Brown	0.00	0.00		
The Granites	0.00	0.00	0.00	

Smooth Pool	0.16	<b>0.24</b>	<b>0.24</b>	0.00
<b>c113</b>				
Ceduna	0.00			
Point Brown	0.00	0.00		
The Granites	0.00	0.00	0.00	
Smooth Pool	0.00	0.00	0.00	0.00
<b>c219</b>				
Ceduna	0.00			
Point Brown	0.00	0.00		
The Granites	0.00	0.00	0.00	
Smooth Pool	0.00	0.00	0.00	0.00
<b>overall</b>	CED	PB	TGR	SMP
Ceduna	0.00			
Point Brown	0.01	0.00		
The Granites	0.06	0.00	0.00	
Smooth Pool	<b>0.86</b>	<b>0.85</b>	<b>0.79</b>	0.00

<i>Parvulastra vivipara</i>	BH	FB	EN
<b>c219</b>			
The Blowhole	0.00		
Fortescue Bay	0.21	0.00	
Eaglehawk Neck	0.09	<b>0.00</b>	0.00
<b>c212</b>			
The Blowhole	0.00		
Fortescue Bay	0.03	0.00	-
Eaglehawk Neck	0.00	0.04	0.00
<b>c114</b>			
The Blowhole	0.00		
Fortescue Bay	0.00	0.00	
Eaglehawk Neck	0.00	0.00	0.00
<b>a110</b>			
The Blowhole	0.00		
Fortescue Bay	0.00	0.00	
Eaglehawk Neck	0.00	0.00	0.00
<b>b202</b>			
The Blowhole	0.00		
Fortescue Bay	0.00	0.00	
Eaglehawk Neck	0.00	0.00	0.00
<b>overall</b>	BH	FB	EN
The Blowhole	0.00		
Fortescue Bay	<b>0.15</b>	0.00	
Eaglehawk Neck	0.09	0.00	0.00

