

## Appendix 1: Submissions from groups

Group	Sub no
1st Beaumaris Sea Scouts	539
Abalone Committee of Seafood Industry Victoria Inc	760
Abalone Fishermens Cooperative Ltd	265
Eastern Zone Abalone Fishery	
Aboriginal Affairs Victoria	1040
Aboriginal & Torres Strait Islander Commission (Vic)	1041
Adobe (Mudbrick) Flats	198
Aireys Inlet & District Association Inc	635
Aireys Inlet Foreshore Committee Of Management	636
Allansford Angling Club	359
Alp Green Network	618
Angair	43
Angair Inc	357
Anglesea Coast Action	279
Anglesea Coast Action	43
Anglesea Motor Yacht Club Inc	1058
Apollo Bay Fishermen's Co-Operative Society Ltd	781
Aquatic Naturalists Inc	724
Australian Anglers Association	48
Australian Democrats Deakin Branch	538
Australian Fisheries Management Authority	987
Australian Labor Party, Portland Branch	420
Australian Marine Conservation Society	43
Australian Marine Conservation Society, Great Ocean Road Branch	248
Australian Marine Sciences Association Victorian Branch	1050
Australian National Sportfishing Assoc, Victorian Branch	490
Australian Sea Urchins Pty Ltd	273
Auswide Fishing	383
Barwon Coast Committee of Management Inc	762
Barwon Heads Primary School	696
Bass Coast Shire Council	731
Bayside City Council	118
Beaumaris Conservation Society Inc	761
Beaumaris Motor Yacht Squadron	11
Bellarine Light Game & Sport Fishing Club	1184
Berwick Angling Club Inc	1076
Bird Observers Club of Australia	723
Bird Observers Club of Australia, Mornington Peninsula Branch	176
Birds Australia	695
Black Rock & Sandringham Conservation Association Inc	512
Board of Works Angling Club (Bowac)	642
Boating Industry Association Of Victoria Ltd	652
Bookmark Biosphere Reserve, Bookmark Programs	356

Group	Sub no
Briargolong Angling Club Inc	732
Brighton Central Angling Club	1042
Bushland Research Council	765
Camperdown Angling Club	1143
Cape Woolamai Progress Association	264
Capella III Fishing Adventures	570
Cardinia Environment Coalition Inc	649
Cardinia Shire Council	32
City of Casey	637
City of Greater Geelong	2302
Cobden Angling Club	749
Colac Angling Club	551
Colac Otway Shire	730
Corangamite Shire Council	733
Corinella Boating & Angling Club Inc	354
Corner Inlet Habitat Association / WBM Pty Ltd	86
Coronet Bay Progress Association Inc	31
Coronet Bay Ratepayers & Residents Association Inc	241
Coronet Bay Reserves Committee of Management	64
Cowes Yacht Club Inc	613
CPSU	1103
Curdievale Angling Club	290
Dandenong Club Sportsfishing Club	L9
Department of Infrastructure	1037
Department of Natural Resources & Environment	387
Devils Elbow Amateur Fishing Club	158
Dolphin Research Institute Inc	619
Drysdale Sportfishing Club	297
East Gippsland Shire Council	459
Eastern Zone Rock Lobster Association	545
Elwood Angling Club	296
Environment Protection Authority	614
Esso Australia Ltd	1018
Fisheries Co-Management Council	323
Framlingham Aboriginal Trust	2341
Frankston Anglers & Boat Owners Club Inc	170
Frankston Beach Association Inc	1079
Friends of Abbott Street - Sandringham	38
Friends of Bass Valley Bush Inc	1174
Friends of Bass Valley Bush Inc / Landcare & Coast Action Group	341
Friends of French Island National Park	116
Friends of Mallacoota Inc	215
Friends of Tamboon Inlet	200

## Appendix 1: Submissions from groups (continued)

Group	Sub no
Friends of The Bay of Islands Coastal Park	427
Friends of The Bluff	748
Friends of The Otway National Park	734
Friends of The Prom	994
Friends of Walkerville	292
Friends of Watkins Bay	22
Fynleen Pty Ltd	1057
Game Fishing Association of Victoria	257
Geelong & District Angling Club & Fish Protection Society	240
Geelong & District Angling Clubs Association	93
Geelong Bluewater Sportsfishing Club	537
Geelong Bushwalking Club	475
Geelong Environment Council	43
Geelong Environment Council Inc	1128
Geelong Field Naturalists Club	43
Geelong Field Naturalists Club Inc	735
Geelong Fly Fishing Club Inc	343
Geelong Gun & Rod Association	99
Geelong Sport & Fishing Club Inc	360
Gippsland Angling Club Association Inc	388
Gippsland Aquaculture Industry Network Inc	725
Gippsland Coastal Board	422
Gippsland Development Ltd	106
Gippsland Lakes Fishing Club Inc	428
Gippsland Water	650
Glen Eira Environment Group Inc	35
Glenelg Shire Council	763
Golden & Paradise Beach Ratepayers & Residents Association Inc	352
Gould League	L89
Greenvale Sport & Game Fishing Club	2347
Hallam Angling Club	1183
Hamilton Field Naturalists Club	517
Hayden Reels / Recreational Fishing Alliance	20
Hobsons Bay City Council / Parks Recreation & Culture	L52
Iluka Conservation Inc	488
Inverloch Residents & Ratepayers Association Inc	1013
Inverloch Residents Development Association	189
Jan Juc Action Group	80
Jan Juc Coast Action	43
Keysborough Angling Club	79
Knox Boat Fishing Club Inc	747
Koo Wee Rup Boat Club	L14
Koroit & District Angling Club Inc	573

Group	Sub no
Koroit Creek Angling Club Inc	689
Laburnum Angling Club Inc	400
Lakes & Wilderness Tourism Australia Inc	299
Lang Lang Coast Action Group	1177
Latrobe University, Dept Of Genetics	266
Leongatha Angling Club Inc	339
Maffra Angling Club Inc	258
Mallacoota Coast Care / Coast Action	535
Mallacoota Inlet Business & Tourism Assoc Inc	991
Marengo Coast Association Inc	2346
Marine & Coastal Community Network	17
Marine Education Society Of Australia	1019
Marine Research Group	396
Marlo Diversity Pty Ltd	394
Melbourne Museum, Children's Museum	770
Melbourne Water	1017
Melton Sport Fishing Club	344
Metropolitan Anglers Association	294
Modewarre & District Angling Club	661
Mordialloc Beaumaris Conservation League Inc	540
Mornington Environment Association Inc	764
Mornington Peninsula Shire Council	295
Moyne Shire	1059
Mt Eliza Association For Environmental Care	370
N.A.G. Inc.	1036
National Herbarium	716
National Party of Australia Vic	324
Natural Environment Association	92
Newhaven Yacht Squadron Inc	1100
Nsw Fisheries	23
Oakdale Angling Club & Fish Protection Society	220
Orbost Angling Club	1178
Orbost Chamber of Commerce	746
Orbost Womens Awareness Group	1078
Otway Planning Association Inc	256
Otwild Adventures	572
Pakenham Angling Club	455
People For Progress	19
Phillip Island Conservation Society	345
Phillip Island Nature Park Australia	162
Polperro Charter Service	1221
Port Campbell Boat Charters	1039
Port Campbell Boat Club	1038

## Appendix 1: Submissions from groups (continued)

Group	Sub no
Port Campbell Environment Group	759
Port Fairy Coast Action Group	154
Port Phillip & Western Port Bay Professional Fishermens Association Inc	321
Port Phillip Conservation Council Inc	610
Port Phillip Regional Catchment & Land Protection Board	1113
Portland Angling Club Inc	507
Portland Professional Fishermans Association Inc	615
Portland Sport & Game Fishing Club	766
Preston Angling Club & Fish Protection Society Inc	84
Project Jonah Victoria Inc	222
Prospectors & Miners Association of Vic Inc	569
Queenscliffe Community Association Inc	1098
Recreational Anglers Using Westernport	489
Rex Hunt Future Fish Foundation	1477
Rhyll Angling Club	L62
Rhyll Phillip Island Angling Club	454
Rhyll Phillip Island Angling Club Inc	40
Rhyll Progress Association	27
Safety Beach Sailing Club	L102
Sale Angling & Sports Fishing Club	792
Scuba Divers Federation Of Victoria	992
Seafood Industry Victoria	372
Seahawke Fish Distribution Centre	L15
Shoreham Foreshore Reserve	611
Sou'west Seafoods Pty Ltd	165
South Eastern Peninsula Residents Association Inc	612
South Gippsland Angling Clubs Association	101
South Gippsland Conservation Society	L69
South Gippsland Conservation Society, Foster Branch	496
South Gippsland Conservation Society Inc, Inverloch Branch	745
South Gippsland Game Fishing Club Inc	298
South Gippsland Shell Discussion Group	728
South Gippsland Shire Council	726
South Gippsland Water	1075
South Gippsland Working Group	214
South West District Association of Angling Club	355
South West Water Authority	399
South Western Fly Fishers	287
Southern Aquaculture Corporation Pty Ltd	1096
Sportspower	993
State Boating Council	687
Stratford & District Angling Club Inc	9
Surfcoast Shire	L83

Group	Sub no
Surfcoast Shire	990
Surfers Appreciating Natural Environment	88
Surf Coast conservations groups	43
Surfrider Foundation, Mornington Peninsula Branch	230
Surfrider Foundation	43
Surfrider Foundation Australia, Surf Coast Branch	395
Surfrider Foundation Melbourne Inc	621
Surfrider Foundation of Australia	63
Swan Bay Caravan Park	457
Swan Bay Environment Association Inc	55
Swan Bay Integrated Catchment Management Committee	544
The Australian Marine Conservation Society, Melbourne Branch	392
The Field Naturalists Club Of Victoria Inc	571
The Southern Fly Fishers Aust Inc	620
The Southern Peninsula Flora & Fauna Association Inc	L31
The Toora & District Community Progress Assoc Inc	30
The Victorian Fishing Tackle Association	L70
Timboon Field Naturalists Club	660
Tooradin Angling Club	342
Toorak Angling Club & Fish Protection Society	110
Torquay Coast Action	43
Torquay Coast Action Inc	727
Torquay Motor Yacht & Angling Club Inc	744
Torquay Public Reserves Committee of Management	555
Tourism Victoria	607
Trentline Pty Ltd	112
Upwey Angling Club	85
Victorian Abalone Divers Association Inc	81
Victorian Abalone Processors Association Inc	651
Victorian Aquaculture Council In	606
Victorian Channels Authority	58
Victorian Coastal Council	376
Victorian Fishing Charter Association	458
Victorian Metropolitan Anglers	87
Victorian National Parks Association	18
Victorian National Parks Association	43
Victorian Piscatorial Council	83
Victorian Wader Study Group	988
VRfish	24
VUT Scuba Club	989
WA Marine Parks & Reserves Authority	6
Walkerville Blue Water Boat & Angling Club	462
Walkerville Foreshore Reserve Committee of Management	333

## Appendix 1: Submissions from groups (continued)

Group	Sub no
Walkerville Ratepayers & Residents Association	65
Waratah Bay Caravan Park	1102
Waratah Bay Ratepayers & Progress Assoc. Inc	217
Warneet North Boat Club Inc	686
Warneet Yacht Club	L68
Warrnambool City Council	609
Warrnambool Field Naturalists	120
Warrnambool Offshore & Light Gamefishing Club	659
Waverley & District Anglers	1308
Wellington Shire Council	353
Werribee & District Anglers Club Inc	L95
Western Abalone Divers Association	358
Western Abalone Pty Ltd	111
Western Coastal Board	1099
Western Port Rent-A-Boat & Marine Centre	729

Group	Sub no
Western Province Environment Users Association	414
Western Region Environment Centre Inc	L94
Western Zone Wrasse Association Inc	L61
Westernport & Peninsula	536
Westernport Angling Club	497
Westernport Bird Observers Club	157
Westernport Safety Council	697
When Australia	1077
Williamstown Newport Anglers Club	1188
Williamstown Sportfishing & Game Club Inc	401
Wonthaggi Angling Club	L20
World Wide Fund For Nature Australia	608
Wyndham City Council	1101
Yarram & District Traders & Tourism	L33

## Appendix 1: Submissions from individuals

Name	Sub no	
Adams	Geoff	1223
Adams	Shirley	1479
Adams Family	Christopher	804
Afedakis	George	2120
Agar	Ron	967
Agg	Wayne	1001
Agnew	G.	3
Aherne	Dion	1480
Aikman	Chris	1481
Ainmouras	George	1822
Albery	Simon	2121
Alcock	Rob	425
Alderson	Brian	2122
Alekovki	Bill	1482
Alexander	P.	145
Alexanderson	Brion	1081
Alexopoulos	John	506
Algeri	Robert	1483
Aliss	George	1484
Allan	David	1486
Allan	Robert	1485
Allan	W.R.	1055
Allan	William J.	327
Allen	Graeme B.	485
Allen	William	1242
Alsop	Tony	752
Altas	P.	1487
Altson	Jonathon	2123
Ambrosini	A.	1488
Amies	B.C.	1054
Amman	Peter	842
Amos	Fred	1311
Anastasios	Kladis	1289
Anderson	Con	2125
Anderson	D.	1489
Anderson	Jan	1244
Anderson	Louise	1030
Anderson	Mark	602
Anderson	Ross	980
Anderson	William	1243
Andreadis	Nick	2124
Andresen	Noel	1241
Andrews	David	253
Andrews	Garry	1216
Andrews	Helen	1312

Name	Sub no	
Andrews	Neville	1313
Andrews	Phillip	249
Andrews	Rosemary	305
Andrews JP	Chris	329
Andrus	Peter	2310
Angelo	Chiodo	2311
Angelos	Costa	1884
Angelos	M/-	1883
Angelucci	P.	1139
Answer	Adam	2126
Antill	J.	1490
Antonioslontis	A.	1491
Antonopoulos	E. & E.	313
Aqualina	Damien	829
Aquilina	Damien	828
Arambatzidis	Daniel	2116
Arambatzidis	Nick	2119
Arambatzidis	Theresa	2117
Arambatzidis	Z.	2118
Archer	James	1492
Arendtse	Roger	1493
Ariens	J.	28
Arklay	Gavin	318
Arlove	J.	1494
Armstead	J.	1495
Armstrong	John	1044
Arnold	DB,GD,SA.&KL	524
Arnold	P.	100
Arnoldson	Greg	1496
Arter	C.	1136
Arthvilla	Mark	1497
Arundel	Helen	1186
Asbury	Graeme	1499
Asbury	S.	1498
Ashman	Brad	1500
Atkinson	K.	1501
Atkinson	Robyn	151
Attard	Charles	1502
Attard	Laurie	1314
Attilio	Francis	2127
Aumann	Dean	923
Aurisch	Des	276
Avaro	David	501
Avery	Linda	413
Avery	Philip	306

Name	Sub no	
Avram	Alex	1503
Avram	Steve	2128
Aylett	Greg	1504
Aziz	S.	44
Aziza	A.	1505
Backx	J.	1506
Bacon	Kevin	1432
Baenziber	Tony	2130
Bagley	L.J.	699
Bailey	B.	1509
Bailey	Peter	423
Bailey	T.	1508
Baillie	T.	854
Bain	Geoff	1315
Bain	George	2280
Baird	Bob	552
Baird	D.W.	1510
Baird	Justin	900
Baker		180
Baker	Charles	1511
Baldacchmo	Victor	1512
Baldovivo	Shane	1513
Balfour	Tim	2279
Ball	Dudley	1316
Ball	Hartley M.	586
Ban	Dean	1515
Banfield	Ray	901
Banks	Corrie	1089
Banks	Jason	1215
Bannuck	Karen	974
Barbar	K.	1516
Barbuto	F.	1516
Barcellona	Michael	1517
Barcellona	Robert	1518
Barclay	Daniel	1433
Barclay	David	1436
Barclay	Mark	1435
Barclay	Meredith	199
Barclay	Robert	1434
Barker	John	232
Barling	Wayde	2312
Barnard	G.	1519
Barnes	Vince	191
Barone	Michael	1520
Barr	M.	862

Name	Sub no	
Barrett	John	205
Barrie	Bob	1521
Barwick	Brendon	844
Barwick	David	843
Barwick	Russell	719
Barwick	S.	667
Barwick	W.A.	666
Bass	Tim	191
Bassett	Willilam	1317
Bateman	George	855
Bathgate	Rachael	1000
Batter	D.	778
Battista	John	2313
Battye	Jeffrey	1522
Baxter	Brendan	1193
Baxter	Brendan	998
Baxter	G.	1523
Baxter	Rohan	1080
Baydar	Omer	1524
Bayes	Scott	1525
Beardwood	Brian	663
Beare	John	1407
Beaton	Brad	384
Beaton	Sheryl	385
Beazley	J.R.	82
Beck	Paul	1526
Beech	David	1527
Beekhuizer	Craig	567
Beer	Graeme	2129
Beeson	R.	1529
Beeson	R.	1528
Begg	Graeme	1318
Begg	Gwenda	1319
Beilby	Geoff	1109
Belcher	L.	1507
Belinic	Dario	1408
Belissimo	Piero	1530
Bell	Barbara	130
Bell	Bill	187
Bell	Bill & Anne	160
Bell	C.	1114
Bell	Navarre	1052
Bell	O.	1070
Benn	Keith	281
Bennett	R.	61

## Appendix 1: Submissions from individuals (continued)

Name	Sub no	
Benton	Wayne	2131
Berglez	Ivan	1531
Berrill	Glenn	1043
Bertone	David	924
Bertram	D.	1532
Bews	S.R. & H.A.	1175
Bibby	Ezra	2132
Binding	Mark	541
Bird	Fiona	211
Bishop	Elise	775
Bishop	Stephen	1533
Bitsakis	Con	1534
Bitton	Glynn	1437
Bjorksten	M.	1535
Bjorksten	M.	1536
Blake	Damien	1012
Blake	T. & B.	47
Blakey	Adam	673
Blegl	Sergio	2133
Blethyn	Brian	2316
Bleumink	Rien	1116
Blewitt	Donald	1537
Blignaut	Leon	2134
Blunden	Neale	503
Board	Karen	131
Bodill	Robert	2135
Bodilly	J.	1538
Bohan	Brian	1.90
Bolitho	B.	2274
Bolza	Joe	1.11
Bond	Clive	1217
Bone	P.K.& S.	76
Bone	Peter	2271
Bonica	T.	1290
Bonner	Garry	513
Bonner	Marc	1539
Booth	Bob	380
Booth	Doug	1310
Booth	Doug	1.77
Booth	J.A.	1097
Booth	Margaret	304
Borg	Daniella	1542
Borg	John	1541
Borg	Mark	1544
Borg	Peter	1545
Borg	Thomas	1543
Borrell	Greg	1321

Name	Sub no	
Bottari	Margaret	1061
Bouboulis	Andrew	1540
Boughton	E.J.	681
Boulan	Anthony	1546
Bour	Bryan	2136
Bourne	Luke	965
Bowden Mlc	Ron	1.101
Bowman	John	1.48
Boyd	Anne	1106
Boyd	Len	1547
Bradley	P.	1145
Bradley	Susan	1144
Bradshaw	Keith	2317
Brandi	Phillip	1548
Brassey	Stuart	1409
Breen	Jarrod	1320
Brennan	G.	1549
Brennan	L.	1552
Brent	Kate	658
Brideson	Ian	597
Brierty	Ray	1550
Briffa	Frank & Linda	753
Briffa	Tony	2137
Briggs	M.	1551
Brittain	T.	1553
Broadfoot	Andrew	132
Broadfoot	Elizabeth	972
Bromfield	G.	2139
Bromley	T.	817
Brooks	Charles	463
Brooks	F.W.	1555
Brooks	Roger	1554
Brosche	C.	1556
Brosche	Lyn	1085
Brown	Dean	1245
Brown	Jayne	664
Brown	L.	26
Brown	L.	133
Brown	M.J.	1056
Brown	Robert G.	2318
Brown	Thoma	2138
Browning	Bill	1558
Browning	Tracey	1557
Bruce	D.M.	371
Bruce	R.	375
Brunton	Maggie	125
Bubulj	Mel	1559

Name	Sub no	
Buchan	Ron	1560
Buckingham	Trevor	1.34
Buckland	Peter	1438
Buettner	Robert	1298
Bulakowski	M.	1561
Bull	Norm	1478
Burchell	Lynette	819
Burchell	Norman	815
Burhop	John	2314
Burhop	Wayne	2315
Burns	Andrea	954
Burns	Andrew	925
Burnside	Shelley	1562
Burton	Bronwyn	754
Burton	S.	656
Bushell	E.	882
Bushell	George	289
Bussey	Glendon J.	2319
Bustard	C.	204
Butcher	R.	2140
Butcher	W.	903
Butera	Anthony	1563
Butler	Robert	1564
Byass	Rosalind	1065
Byrne	Terry	1565
Cain	Eunice	566
Cain	John	531
Caio	Luorenzo	1566
Calaby	Jan	1.74
Calaby	Ray	1.75
Calafiore	Adrian	926
Caldecott	K.	1578
Calleja	Frank	1567
Callinan	T.	904
Cambereri	Rosa	1568
Cameron	James	1.35
Cameron	John	777
Cameron	Ken	927
Cameron	R.	1.36
Camilleri	Alfred	1570
Camilleri	G.	1569
Camilleri	M.	1439
Camp	Scott	1571
Campbell	David	1580
Campbell	Frank	164
Campbell	Geoff	1246
Campbell	Noel	1147

Name	Sub no	
Cannizzaro	S.	1572
Cannon	Shane	1573
Capoulas	Caris	1584
Carabott	V. & A.	319
Caram	W.	1582
Cardinal	Belinda	776
Carfura	Kevin	1574
Carlile	Max	1322
Carlsson	Mike	1579
Carpenter	Brian	983
Carpenter	Patsy	1.2
Carr	Michael	1440
Carr	Richard	1581
Carracher	Matthew	971
Carrroll	Ian	639
Carrucan	Shane	2320
Carson	Linda	134
Carson	Robert	707
Carter	James	1576
Cartwright	James	1575
Caruana	Ray	1577
Casey	Robert	1323
Cassar	Charlie	2115
Cassar	Daniel	1441
Cassar	J.	412
Castle	Maree	1068
Castledine	C.	1583
Cavaggion	Marco	2321
Cayley	Vyvyan	461
Celeste	J.	1324
Ceniti	Joe	1585
Cerisara	R.	1442
Chalmers	B.	448
Chamma	Taher	1593
Chandler	Gil	312
Chapman	Jeffrey	2141
Charallam	K.	1590
Cheah	Daphne	986
Cheah	Greg	2142
Cheetham	Greg	518
Chiron	Anthony	1284
Chiron	Paul	1285
Chominak	George	1588
Chote	David	2143
Chrislets	W.H.	591
Christensen	L.	1586
Chu	Y.	1587

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Cipri Peter	1591
Clark David	1082
Clark G.	2305
Clark Jennifer	953
Clark Lloyd	1326
Clark Russell	1327
Clark Russell	2144
Clark Tracy	1325
Clarke Donna	135
Clarke Ian	905
Clarke J. & J.	449
Clarke Kenneth	1589
Clarkson M.	1148
Clayton C.	1410
Clifford Graham	430
Clipsham John	1592
Clohesy Peter	688
Coates Tony	1599
Cobbledick Cliff	288
Cochrane Deidre	1026
Cockman Paul	1612
Coe Gavin	1607
Coghlan Michael K.	336
Cogo Luciano	1328
Cohn Simon	1598
Cole Babrielle	136
Cole Rodney	2146
Coley Graeme	2150
Collins Peter	601
Collison James	1152
Colombani Raymond	2151
Colosimo Frank	1594
Comito David	2149
Conde J.	1609
Condello Phillip	1606
Connelly Scott	2145
Connizarro John	1608
Connley Kerrie	188
Conte Alfredo	1329
Conte Dolores	1330
Conte Fortuna	1334
Conte Mario	1333
Conte Roberto	1331
Conte S.	1332
Cook Anthony	2152
Cooke Alison	2147
Cooke Garry	1601
Coon Anthony	1596

Name	Sub no
Coon D.R.	1595
Cooper Alex	1603
Cooper John	1335
Cooper Steve	750
Cooper Steven	107
Coote Modesty	1106
Copley Caroline	331
Cormick Shaun	1605
Costa J.	1597
Costa Ronald	1309
Costello Mark	701
Cott C.	558
Cotton R.HG.H.	1086
Couch T.	883
Coucounaras D.	154
Coulsen Shane	1611
Coulthard R.	793
Coulton Rodney	528
Courtenay Georgette	196
Cousland R.	1600
Coutt Andrew	1411
Cowah Stephen	1336
Coward G.J.	1604
Cox Cheryl	1602
Cox Stephen	1610
Craig Ian	1613
Crawford Paul	1614
Crefffield John	671
Crewes Michael R.	1337
Cridland B. & C.	1135
Cripps Alan	514
Cripps Brett	378
Cripps Don G.	174
Cripps M.E.	260
Cripps Violet	515
Cripps Wayne	379
Cripps Wendy	668
Croatto R.	1617
Crocker Robin	767
Croft John	1618
Crofts Margrit	221
Crook Lance	1619
Crothers Neil	1155
Cruikshank John	1616
Cruikshank John	1615
Culbard & Tinker Ian & Kaylene	315
Cullen G.	440
Cullen K.	1621

Name	Sub no
Cuming Brian	982
Currenti Angelo	1620
Currer Peter	1015
Curtis F.	57
Cusworth Steve	1247
Cutler Bruce	645
Dacombe Craig	1625
Dagher Youseff	1623
Dahlberg B.	906
Dalavekis John	2154
Daley Kevin	1107
Dalla Costa Mark	2148
Dalla Rosa John	1626
Dalton Peter	1423
Dance Barry	616
Danges Daryl K.	782
Daniel Chris	435
Daniels Greg	961
Danks Kerry	137
Dann Peter	600
Darlington F.	1622
Darmanin E.	1624
Darmody Shane	2153
Dashper Stuart	243
Davenport Max	1627
Davey Arthur	1338
Davidson Rosemary	742
Davies Barry	1104
Davies Christopher	1214
Davies Harry	159
Davies Richard	1224
Davis A.	434
Davis Doug	1053
Davis Harry	176
Davis Mark	184
Dawson A.	1630
Dawson Brad	1629
Dawson R.	1631
Dawson Travis	1628
Deathe Alan	16
Deathe Diane	15
Deaville K.	160
Degran Chris	1635
Deleyev Julia	163
Delisle Paul	1638
Demara Robert	1637
Dempsey Gordon	1639
Dendle Neil	138

Name	Sub no
Deran Sedat	1633
Desquale Anthony	1636
Deveson John	1632
Dew W.	60
Dexter Tod	190
Dezilwa Laar	1634
Di Cori Atilio	1640
Dib Danny	1641
Dicic Andrew	2270
Dickinson Jeffrey	2156
Dickson Stephen	1643
Didio John	1248
Difuccio Ida	156
Difuccio Rick	157
Difuccio Robert & Amanda	155
Dimakis Angelo	1339
Dipietro Josh	1213
Dipietro Phil	1212
Dispirito Joe	1642
Dixon David	997
Dixon Kraig	2155
Dixon Raymon	445
Dobson B.G. & K.	46
Dobson F.A.	1225
Doddrell R.A.	1291
Dodds Donald	1424
Dodkins Dulcie	1443
Dodkins Tom	1218
Dodsworth Pam	1095
Doherty Kerry	1444
Dohnt Sharon	2281
Dolente Paul	1645
Domm David	2157
Don Graham	2100
Donaldson Blair, Ewen & Dorothy	409
Donia Peter	1644
Donnaly A.	188
Donnan C.J.	139
Dooley Warwick	2158
Doran John And Andrea	654
Doran Kevin W.	381
Dorell R.	226
Dorey G.	71
Dougall I.	856
Douglas Grace	1341

## Appendix 1: Submissions from individuals (continued)

Name	Sub no	
Douglas	Ian	1343
Douglas	J.	29
Douglas	K.& R.	907
Douglas	Zaydn	1342
Dow	Graham	1340
Dowall	Keith & Jim	590
Dowell	Gavin	1166
Downes	James	999
Downey	Richard	672
Downton	Peter	1162
Dowsett	Athol H.	144
Dowsett	L.	1412
Doyle	Mark & Eva	705
Draper	J.	1646
Dreyfus Qc	Mark	132
Drummond	R.	67
Duffin	J.	1157
Duffy	Noel	806
Duke	Jennifer J.	736
Duncan	Greg	126
Duncanson	Ross	526
Dunn	Fay	477
Dunn	Norman	2306
Dunn	William	2307
Dunphy	B.J.	743
Duranou	Paul	1652
Durbali	Albert	1651
Durham	Geoff	277
Dusenjko	Ivan	1649
Dusenjko	Michael	1650
Dutka	A.	1648
Dutka	George	1647
Dwyer	A.	836
Dyson	Brian	2322
Dyson	Jill	481
Ea	Leang-Ty	419
Eadie	Lyn	465
Ealey	E.H.M.	53
Easton	Dorothy	181
Easton	E.R. & J.B.	525
Eddie	Martin	1250
Eddie	Ross	1249
Edmonds	Adam	708
Edney	G.	54
Edwards	G.	349
Edwards	Graham	808

Name	Sub no	
Edwards	Kellie	1344
Edwards	Paul	1659
Egan	Gerald	820
Eichler	John	533
El Hassan	Tala	2095
Elayoubi	Walid	1653
Eldred	Ross	690
Elliot	C.J.	521
Elliot	Daryl	1299
Elliot	J.A.	1654
Elliott	Eric	269
Elliott	W.R.& G.M.	185
Elliot	Wally	293
Ellis	J.B.	42
Ellis	Michael	1445
Ellis	Michelle	633
Elmes	Christopher	1655
Elsworth	G.	529
Elton	Bruce	802
Elzein	Rachelle	1105
Emilan	P.	1658
Emmerton	Dale	2159
Emmins	J.J.	2098
Emmuneal	Danielidis	2160
Engel	Clinton	1656
Esparon	E.	2161
Estcourt	Mike	547
Estoppey	Dave	2282
Evans	Amanda	114
Evans	Gary	2162
Evans	Ken	1211
Ewinger	Helmuth	1657
Facchi	Roger	1662
Fagone	Fran	1663
Fagone	Joe	1665
Fagone	Linda	1666
Fagone	Vince	1664
Falla	Steven	1194
Fallow & Hayward	John & Rebecca	713
Falvo	Pino	1660
Falzan	Michael	1345
Family	Joynson	911
Farmer	Glen	1667
Farquhar	M.J.	178
Farrugia	Derek	1661
Fary	Anthony	790

Name	Sub no	
Fary	Ray	588
Fay	Marilyn	1348
Febo	P.	1668
Feltham	Adrian	1346
Fergita	Joe	1446
Ferrari-Mela	M.	1131
Ferretto	J.	1669
Feruglio	Brian	2283
Fierro	Enzio	835
Filipendin	Boris	928
Filippatus	Napoleon	1671
Filippone	Anthony	2114
Fillmore	Peter	738
Fincher	Cyril	286
Fink	R.	788
Finlay	Thomas	845
Finn	Rod	2284
Finn	Shane	2285
Fisher	James	677
Fisher	Mathew	676
Fisk	S.R.	784
Fitzgerald	Gus	589
Fitzsimmons	Brendan	234
Fitzsimmons	James	364
Fitzsimons	Elizabeth	712
Flaassen	Frank	1455
Flanders	Bruce	885
Flanders	M.	884
Fleming	Anthony	929
Fletcher	S.	848
Fletcher	Susan	847
Florio	C.	1670
Flower	Tonya	1104
Fodor	Robert	2163
Fontana	Jon	138
Fonzant	I.	1674
Foote	Doug & Inez	634
Footit	Wayne	2164
Ford	F.	70
Ford	Robert	1672
Ford	Russell	155
Formosa	J.	36
Formosa	Patrick	1673
Forrest	John	1675
Forrest	John S.	159
Forster	Mike	186

Name	Sub no	
Foster	Matthew J.	1210
Foster	Shaun J.	347
Fowler	B.	97
Fox	Michael	2286
Francini	Robert	1195
Francis	Anthony	1676
Francis	Kevin	1425
Franjic	R.	1681
Frayman	Leon	2166
Frazer	C.	1133
Frazer	Paul	2323
Frederiksen	Kerin	1678
Free	Norman J.	2165
French	Helen	122
Friend	Barney	930
Friend	Brian	1679
Frost	Martin	1347
Fry	Chris	1680
Ftohogiannis	John	1682
Fuller	Don	2272
Funnell	Peter	1349
Furlong	Brian	1677
Fyfe	Adrian	274
Fyfe	David	1251
Gage	Cameron	1219
Gale	Darren	1683
Galloway	Hector M	1350
Garbuio	M.	68
Gardiner	Andrew	282
Gardiner & Buchanan	Beth & Andrew	1084
Gardiner	Craig	1688
Gardiner	N.	139
Garnham	Janet	121
Gasparotti	Carlos	1685
Gauci	George	1686
Gaunt	Russell	1352
Gaunt	Walter H.	1351
Gaylard	Dean	1684
Gaylard	John	1185
Gazan	J.	103
Gazis	Kathy	2112
Gazis	Tas	2113
Gazzo	Joe	1687
Geff	Peter	1692
Gemin	Michael	1691

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Gemmell	1689
Genoni	908
George	2094
George	1021
Georgiou	1690
Gereige	1292
Gerum	140
Geyhan	2168
Giblett	310
Giblin	886
Giblin	887
Giblin	888
Giblin	889
Gibson	2167
Giddins	426
Gilchrist	1694
Gilchrist	1693
Giles	181
Giles	1696
Gilhome	225
Gilks	141
Gilks	142
Gillett	1447
Gillies	605
Gilligan	2278
Giudici	973
Giuliano	250
Glass	367
Glentkes	1695
Godfrey	1698
Goff	300
Goldsmith	2101
Goldsworthy	722
Goodfellow	2096
Goodier	109
Goodwin	800
Goodwin	280
Gordye	141
Gore	1240
Gorencic	1700
Gorgorinis	966
Gorman	1699
Gorman	755
Gorman	1697
Gosbell	436
Gough	13
Graham	171

Name	Sub no
Graham & Davids	617
Graham	720
Granovac	1705
Grant	1006
Grant	1125
Grant	1702
Grant	655
Grass	1704
Gration	161
Gray	2173
Gray	909
Gray	2171
Gray	2172
Gray	1701
Grayden	L12
Grayden	L13
Grech	798
Grech	1706
Grech	2260
Green	831
Greene	1353
Greenhow	628
Greening	1035
Greening	1354
Gregson	2169
Griffiths	563
Griffiths	216
Grigoriou	2170
Grisha	2324
Gross	484
Grossi	1703
Groves	561
Gruber	1449
Gueresk	1710
Guest	1707
Guli	981
Gunday	469
Gurmesevic	1708
Gusman	1709
Guy	453
Guy	452
Haack	1239
Hagstrom	2174
Hahnel	1296
Haines	73
Halil	1714

Name	Sub no
Hall	74
Hall	194
Hallem	1448
Hamilton	1252
Hammell	1355
Hammond	437
Hammond	441
Hammond	438
Hammond	439
Hancock	1196
Handley	2175
Hands	931
Hanegraaf & Driscoll	739
Hanna	1181
Hannan	1719
Hansen	271
Harbeck	1711
Harerecht	683
Hargreaves	1717
Hargrove	98
Harlond	751
Harmat	504
Harmon	1720
Harper	1716
Harris	1712
Harris	2176
Harris	2102
Harris	1713
Harrison	1450
Harrison	2177
Harrison	1356
Harrison	932
Harrison	330
Hart	812
Harvey-Prinselaar	51
Harwood	2178
Haslam	113
Hastings	704
Hateley	1721
Hateljan	1715
Hatzis	952
Hausegger	1357
Hawkins	431
Hayden	102
Hayes	L10
Hayes	1718

Name	Sub no
Hayes	678
Haynes	1723
Heaney	1727
Heath	460
Hebbard	386
Heffernan	15
Heine	443
Heintz	1728
Heislars	647
Henderson	703
Hennessy	1724
Henry	143
Henry	1451
Henshaw	L78
Henson	L93
Hepburn	1359
Hepner	632
Herd	1726
Hereaka	1358
Heron	382
Heuser	1725
Hichisson	195
Hicks	317
Hill	2268
Hill	L24
Hill	864
Hill	1027
Hill	956
Hill	1729
Hillebrand	1722
Hilvert	373
Hinchliffe	832
Hinds	2099
Hines	2179
Hipwell	267
Hiraga	1730
Hoad	482
Hobbs	769
Hobday	1360
Holderness	207
Holland	1361
Hollingsworth	1733
Holmes	2180
Holmes	756
Holzfeind	2181
Holzfeind	363
Holzfeind	2182

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Homes	657
Honan	550
Hore	1362
Hornby	2183
Horne	1452
Horwill	224
Hose	14
Hose	556
Hose	115
Hotchin	1049
Houben	958
Hourakis	1731
Howard	1105
Howard	166
Howell	1129
Howell	1732
Hoyle	332
Hoyles	592
Hughes	338
Hughes	1754
Hugi Lin	1755
Hume	2184
Humphrey	168
Hunt	90
Hunt	527
Hunter	2185
Hunter	692
Hunter	1759
Hunter	714
Hunter	2187
Hunter	2186
Hunyh	1760
Hurford	2304
Hurst	456
Hussey	144
Hutcheon	1756
Hutchinson	1476
Huther	1168
Huther	823
Huxham	1758
Hyde	1064
Hyslop	1124
Igen	1761
Ilil	1762
Iluk	1763
Imbesi	1764
Indelope	1364

Name	Sub no
Ingram	405
Ingram	404
Ingram	740
Interlandi	1765
Ireland	933
Irving	910
Irving	10
Isidro	1363
Iskra	837
Israel	1766
Italiano	1453
Jackway	254
Jacobson	626
Jakobovic	1253
James	1254
James	1767
Jamieson	2267
Jansson	424
Jayawardene	1107
Jeans	2188
Jenkins	166
Jennings	1303
Jennings	822
Jessop	603
Jewell	193
Jitnah	1083
Johannesen	1092
Johannesen	1073
John	1769
Johnson	846
Johnson	1187
Johnson	2277
Johnson	464
Johnson	955
Johnston	1768
Johnston	2287
Johnston	219
Johnston	2288
Johnston	1454
Jones	66
Jones	795
Jones	41
Jones	1368
Jones	368
Jones	1365
Jones	1367

Name	Sub no
Jones	1771
Jones	1366
Jones	1770
Jones	410
Jones	796
Juiett	863
Jung	2189
Jungwirth	244
Kachakojus	2191
Kakavoules	2190
Kampean	1772
Karakatsanis	1773
Karakatsanis	1775
Karalis	1774
Karge	33
Kay	1165
Kay	1163
Kay	1164
Kazakas	37
Kealy	1777
Kean	1108
Keegan	1778
Kele	1780
Kelley	587
Kells	1776
Kelly	1779
Kelsall	912
Kemmler	2192
Kendell	78
Kennedy	1134
Kennedy	785
Kenny	2289
Kenwood	108
Kettels	18
Khodr	1782
Khoury	1781
Kibria	979
King	1413
King	1192
King	1783
Kingston	913
Kinsella	522
Kirkwood	984
Kirsop	95
Kitching	1784
Klimcrak	1369
Knibbs	1785

Name	Sub no
Knight	1370
Knight	2325
Knights	890
Kober	1426
Kokken	1786
Kolby	865
Komen	794
Konur	1787
Koop	653
Kosinski	1788
Kotzasiannidis	1789
Kouso	1790
Kouts	1456
Krafft	145
Krakoeur	1792
Kudrenko	1286
Kuit	700
Kunkel	1791
Kurle	328
La Fontaine	1167
La Grant	146
Labb	1797
Laing	325
Lamont	1799
Lamont	1800
Langdon	1796
Langley	682
Larsen	165
Latchford	147
Lavandiera	1795
Lawless	2291
Lawless	2290
Lawn	1457
Lawrence	1798
Lawrence	1794
Lawson	1793
Lay	1005
Lay	2193
Le Page	509
Lea	2197
Leary	2194
Leckie	245
Leditschke	1427
Lee	1804
Lee	1805
Lee	391
Lee	1428

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Lee John	850
Lee Ken	2195
Lee Terry	1371
Leeming Warick M.	2196
Leen John & Tony	1066
Lefoe Peter	2326
Legione John	1372
Leguier R.	1803
Leibhardt Lena	1150
Leibhardt Rebecca	1151
Leigh T.	878
Leitherdt Chris	516
Lett Rodney F.	505
Lewandowski Michael	104
Lewis Jeff & Belinda	625
Lewis John	1801
Lewis John W.	362
Lewis M.	450
Lewis Mick	1802
Lewis Neville	393
Lewis R & J & C	L18
Lewis Richard	197
Librio Jan	1373
Liebscher Carol	557
Linardos George	1806
Linder Andrew	1256
Linder Ian	1255
Lindsay C.	1807
Lindsey John	1034
Linford Bill & Cheryl	163
Linguey Ben	2343
Linguey Trevor	2342
Linskens Herbert	574
Little Michael	142
Little Rob	1458
Livingston John	2198
Loftus-Hills Lois	183
Long Stephen	498
Longo Robert	1808
Lonsing Dirk	1257
Lord Simon	285
Loughrey T.	75
Love J.L.	246
Loveless Mark	866
Lovell Brian	1087

Name	Sub no
Loving Paul	546
Loving Vincent H.	737
Low Siong	1809
Luchetta Allan	1238
Lucht Cameron	1258
Lucht Horst	1259
Lucht Thomas	1260
Lupson John	2327
Luttin Jillian	2199
Lynch Brian	1810
Lyons Chris	1226
Macarthur Malcolm	121
Macdonald Murray	622
Mace John	1459
Macfarlane I.	2200
Macgibbon Robin L.	2328
Macgregor David	596
Maciulis Vytautas	146
Mackay W.	1816
Mackiewicz G.	1117
Mackley Desmond	308
Mackley Hiliary	309
Mactaggart Peter	789
Madden P.	25
Maddigan Peter & Sophie	365
Maddigan Shane	1220
Maddox John	809
Madgziarz S.	914
Madley Brian	960
Madsen Janine	208
Mahoney, Sheryl,	641
Naylor & Chris &	
Dickinson Hayley	
Main A.D.	594
Maiolo F.	1811
Malby Hugh	1237
Male L G	1825
Mallios John	1824
Malloy H.	1130
Malone Eamonn	1826
Mammos Jim	2203
Mandic Joe	1294
Mann Rob	1460
Manna Sami	1820
Mantz James	1823
Mara Mick	934
Marasco Gino	1813

Name	Sub no
Maratzinis S.	2110
Marendaz Warren	1461
Margeridis Penny	1817
Marino A.	1227
Marion Thomas I	2201
Markulin Drazen	1814
Markulin Nevin	1815
Marpets Phillip	870
Marples Russell	1812
Marr Antony	1738
Marriott Gavin	935
Marriott Ruth	1020
Marsden John	1374
Marsh John	1821
Marshall Monica	L108
Marshall Rebecca	478
Martin	1818
Martin G.D.	2103
Martin Geoffrey	2275
Martin Glenn	1827
Martin John	2202
Martin Robert	1072
Martino Michael	1819
Maruzza Rocco	825
Maruzza V.	826
Marx M.	21
Mason Jenny	710
Mason Paul	959
Mason R.	1828
Mason Trevor	599
Matarczyk Michael	411
Matheson Sophie	1022
Mathews Ken	326
Mathews Peter	1283
Matthews Anthony	416
Mauderer George	242
Maxwell Ronald & Daphne	604
May Neil	361
Mcalpine Barbara & Ian	849
Mcbride Adele	158
Mcbride Jean	1170
Mcbride K.	1169
Mccomb Stephen	791
Mccracken John	2292
Mccrohan Damian	212
Mccubbin M.	2104

Name	Sub no
Mccubbin Malcolm	L28
Mcculloch Lachlan	2204
Mccully H.R.	564
Mcdonald Ron	1090
Mcdougall Andrew	500
Mcdougall Russell	1375
Mcewan S.	39
Mcfee John	1122
Megaw Alexander	838
Mcgifford Robert	861
Mcgough G & P	1138
Mcgowan Craig	1830
Mcgrath Peter	1376
Mchale	1834
Mchutchison R.	1757
Mcinnis C.	803
Mcinnis Mervyn	797
Mcintosh Neil & Marie	201
Mckage Robert	821
Mckay Campbell	530
Mckee Eileen	595
Mckellar Andrew	1414
Mckendry Stewart	1197
Mckenzie Alan B.	213
Mckenzie Cameron	199
Mckenzie Margaret	623
Mckeown Ian	1111
Mekie Andrew	1831
Mckinnell Andrew	119
Mckinnon Judy	202
Mckinnon Trevor	578
Mclaughlin R.	1832
Mclaughlin T.	1829
McLeod G.	801
McLeod Phillip	574
Mcmahon Chris	2206
Mcmahon Grace	2205
Mcmasters Daniel	487
Mcmasters Wayne	421
Mcnabb Arthur	314
Mcnabb Kevin	123
Mcnamara Michael	780
Mcnulty Alison	771
Mcpherson W.E.	1833
Mcquade Roy	1377
Medlin M.C.	1837
Medwin Peter	1835

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Mee	52
Melchionna	1836
Menhennet	89
Menkhorst	1011
Menzel	675
Meredith	1236
Merrett	415
Merrillegs	2207
Micallef	1840
Micallef	1839
Michod	1462
Mighionico	2111
Mihai	1843
Mihai	1844
Mildren	1415
Miles	1416
Miles	717
Miles	1841
Miliadis	1842
Millard	1378
Millard	1379
Milledge	871
Miller	2345
Miller	2208
Millican	811
Mills	1261
Mills	1262
Mills	757
Mills	2209
Mills	1263
Mills	1264
Mills	259
Minear Oam	167
Minchan	172
Mirza	1847
Mitchell	251
Mitchell	5
Mitchell	1846
Mitchell	996
Mitchell	1838
Mitchell	350
Mitreviski	1845
Moait	177
Moerkerk	1010
Molan	374
Molnar	813
Mons	1380

Name	Sub no
Montebello	936
Montgomery	1429
Moodie	834
Moore	2329
Moore	869
Moore	868
Mordoukhaev	2210
Morgan	1850
Morgan	1381
Morgan	1851
Moroney	577
Morris	2293
Morris	2294
Morris	337
Morrison	1265
Morrison	4
Morrison	1266
Morrison	1848
Morrow	841
Morton	1182
Moses	1852
Mounsey	444
Mountt	2295
Mousaferiadis	1382
Mouskeftaras	2211
Mouskeftaras	2212
Moutchis	1849
Muir	1856
Muirfield	1288
Mulholland	1858
Mulholland	1859
Mullins	1857
Mullins	1855
Munro	532
Murfett	1383
Murn	2214
Murn	2213
Murphy	1854
Murray	852
Murray	235
Murray	122
Musolino	1853
Muszczyk	867
Mynott	1153
Nastos	1860
Nathan	818
Nathan	L67

Name	Sub no
Neale	1463
Neill	1865
Neilsen	1863
Nelson	680
Nelson	598
Nermin	1861
Neubauer	1126
Neuchat	263
Nevill	1004
Newstead	1862
Newton	184
Nicholls	2215
Nichols	1464
Nicholson	272
Nicholson	56
Nido	1866
Nido	1917
Nikolovski	1867
Norris	96
Norris	34
Norton	957
Nottage	1465
Nowak	L7
Noyes-Brown	684
Nunn	1267
Nuoleun	1864
O'borne	510
O'borne	511
O'brien	2269
O'bryan	72
O'callaghan	1118
O'connell	1869
O'connell	559
O'connor	124
O'donohue	1871
O'donohue	1870
O'farrell	1384
O'farrell	1386
O'farrell	1385
O'leary	891
O'mealy	L19
O'meara	1873
O'neill	1874
O'neill	1875
O'reilly	1235
O'reilly	1876
O'shannassy	549

Name	Sub no
O'toole	491
O'Brien	1868
Occhipinti	1466
Oddo	468
Ogilvie	520
Oliver	2216
O'loughlin	147
Olsiewsig	1872
Orgill	397
Orlando	1877
Osborne	231
Osborne	229
Overgaauw	874
Overgaauw	872
Overgaauw	875
Overgaauw	873
Ozolins	1878
Pakham	2217
Palise	1887
Pallins	783
Palmarella	1888
Pandelidis	2218
Pandelidis	2220
Pandelidis	2219
Pannell	1886
Paoletta	1882
Papatua	1885
Pappas	937
Parker	1387
Parker	830
Parnis	1879
Parr	787
Parr	669
Parsons	1228
Parsons	1140
Parsons	893
Parsons	892
Parsons	1141
Pascoe	210
Pascoe	718
Pascoe	148
Passmore	1234
Patane	1889
Paterson	1171
Patkin	494
Patterson	1890
Patterson	1881

## Appendix 1: Submissions from individuals (continued)

Name	Sub no	
Pearson	J.W.	206
Pease	Richard	175
Pedrina	Bill	1191
Pedrina	William	149
Peel	Graeme	408
Peel	Joanne	407
Peel	Pat	406
Pegkerois	P.	1880
Pell	John	508
Pemberton	Bill	709
Penney	John	239
Penrose	B.L.	1892
Penrose	L.J.	1895
Penrose	V.	1891
Pepperell	G.	403
Pernek	Frank	1894
Perry	Raymond & Margaret	209
Peschel	Wally	2221
Petho	Les	1268
Petrie	Mark	2105
Petrovic	C.	1893
Philips	Priscila	L109
Phillippousis	Steve	1897
Phillips	Peter & Mary	171
Phillips	Thomas J.	2330
Phipps	S.	1421
Piazza	Salvatore	1899
Pickett	D.	301
Piggott	Michael	1307
Pike	Ian	1896
Pinto	Salvatore	1198
Pitzer	Robert	1898
Place	B.	857
Planinic	Milan	1900
Plecas	J.	62
Plowright	J.	1901
Plozza	Kevin J.	348
Plummer	Garry J.	2331
Plummer	Phillip	486
Plummer	Tim	1229
Plunkett	Alan	2222
Politini	S.	1903
Pollard	Barry	418
Polson	Chris	499
Pook	Stephen	2223
Portaro	B.	1904

Name	Sub no	
Porter	Christine	568
Potter	E.	2333
Potter	Huebert A.	1468
Potter	John	2332
Poulter	Tom	2224
Poulton	Maurice	238
Powell	Paul	1902
Pratt	Tim	938
Preston	Michael	963
Preston	Wayne	492
Price	Barrie	1906
Price	L.	773
Primmer	Alan	1048
Probert	B.	1069
Pulham	Colin	629
Pulman	B.	902
Pulvirenti	Tony	1190
Puskaric	Marty	1905
Pye	Warren	L25
Quinn	R.	270
Quirk	K.	1936
Quirk	Terry	1938
Quoc Nanh	Lieu	1937
Radley	C.	1908
Rambridge	Ian	1388
Ramsay	Carole	1123
Ramsay	Kenneth	1127
Ramunno	T.	1912
Randell	Peter	156
Rankin	Greg	1911
Rankin	W.	1417
Rantall	Alan	858
Rantall	Roy & Shirley	442
Ratcliffe	Barbara	471
Ratcliffe	David	474
Ratcliffe	Frank	470
Ratcliffe	Mark	472
Ratcliffe	Peter	473
Ravanello	Michael	1910
Rawlins	David	223
Rawson	Brendan	L30
Rawson	Julie	L29
Rawson	Matthew	1051
Ray	John	1909
Rayner	Lee	1907
Rea	Heath	1915
Rebbechi	Elizabeth	876

Name	Sub no	
Rebbechi	Paul	877
Rees	Gillian	1149
Reichman	Charles	1914
Reid	James	2226
Reid	Kevin	1913
Reid	Malcolm	L73
Reinisch	Frank	L85
Relecker	Harry	975
Rennick	S.	7
Rennie	J.	1132
Ribic	Marko	1269
Richardson	Andrew	1063
Richardson	Bill	1916
Richens	Timothy P.	369
Ridgway	Bruce	1179
Ridley	D.	1270
Rigby	Kevin	2225
Rigoni	Robert	1919
Riordan	P.	1301
Rippon	Glenn	519
Ritchie	Arthur	2264
Ritchie	Damian	2265
Ritchie	David	630
Rivalland	A.	1918
Roach	Graham	1923
Robbins	Terrence C.	565
Roberts	Patricia	366
Roberts	R.	1922
Roberts	Steve	554
Roberts	Wayne	1926
Robertson	Mark	1928
Robertson	Peter	640
Robinson	Albert	117
Robinson	Andrew	2227
Robinson	Fred	2308
Robinson	G.L.	149
Robinson	George	2309
Rock	Jon	779
Rock	Michael G.	L37
Rockford	A.D.	575
Rodrigue	Mark	646
Roes	Rayma J.	228
Rogala	Richard	1927
Rogers	Steve	1470
Rolekakis	Tony	1924
Rolland	Thierry	1003
Rolls	Trevor	2228

Name	Sub no	
Romanin	David	1921
Romans	Robert	105
Rooney	Stephen	1271
Rose	Barry	1920
Rose	Carolina	150
Rosenfield	David M.	169
Ross	Anthony	1389
Ross	Don	1091
Ross	Ian	2229
Ross	James	691
Rossi	Daniel	2230
Rossi	Franco	1199
Rout	Stephen, Anne & Kate	627
Rowbury	D.	1925
Rowe	M.I.	77
Rowe	Steve	1287
Rowlands	Dennis	2334
Rowsell	M & H	1024
Rozich	Eddy	1929
Rudge	James	1930
Rudge	Tony	1931
Russell	Alan	1932
Rust	Ray	1390
Ryan		1933
Ryan	Dennis	2231
Ryan	Hugh	894
Ryan	Neil	2232
Ryan	R.	1272
Rzecki	George	1934
Rzeszutek	M.	1935
Sacco	Ralph	1200
Sahin	Remzi	1947
Sahin	Sefa	1948
Sainsbury	Ian	585
Sainter	David	151
Sakkas	Jim	534
Salameuser	R.F.	179
Sam	P.	1944
San Giorgio	Angelo	1940
Sandham	J.	1946
Sandon	Karen	398
Sanguinetti	Geoff	643
Santmaria	R.	584
Sartori	Angelo	1945
Sass	Michael	1943
Saunders	N.	50

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Saunders R.	1964
Savage Peter	1941
Savegh Saud	1942
Scale Heather	2335
Scale Tim	2336
Scarlota E.	1956
Schadendorff Edith	1222
Scheipers V.	1950
Schicuna Leo	2276
Schilg Lindsay	L16
Schleibs F.	1954
Schleibs Kathleen	1953
Schleibs Paul	1955
Schlupalius Neil	2262
Schmidt Raymond	1189
Schnelle E. Guenter	1306
Schwaar T.	1949
Scoble Andrew	968
Scott Ashleigh	1951
Scott Ashley	939
Scott E.R.	741
Scott Michael	941
Scott Troy	940
Sculac David	1952
Scullin Ben	2233
Seaman Mark	1469
Searl Charles M.	548
Seddon A.	1962
Sedelies H.K. & A.L.	275
See Vernon	1959
Semmens Gary	1961
Serap Rodney	1957
Servello Tony	833
Setford Geoffrey	1431
Setiawan Ferny	1201
Sette Luigi	1958
Setters Tony	1016
Setters Yvonne	1025
Sevastas Manny	1960
Seward Bryan	523
Shamsabadi Walter	1965
Sharman Marion	480
Sharman Paul	483
Sharp Geoff	2234
Sharp Trevor	L2
Shaw Bryan	1208
Shaw Graeme	853

Name	Sub no
Shaw Melanie	1968
Shea Paul	1046
Shearer Heather	237
Shearer Keith	236
Sheehy Kathleen	283
Sheils K.C.	12
Shepherd Louise	L96
Sheppard J.	1967
Sheppard Norm	252
Sheppard T.	1966
Sherlock Simon	1391
Shields Don	1963
Shields Tony	1154
Shiels Steve	799
Shomaly Glenda	711
Short Dwayne	1422
Shotton John	1295
Sibley B. & L.	451
Silva Dave	2097
Simestar Graham	1969
Simmonds R.	255
Simon Leslie	2235
Simpkin Luke & Julie	774
Simpson Bill	1274
Simpson Peter	1275
Simpson Rhonda	1273
Simyanoski S.	1970
Sishivanousic	1939
Skaftouros E.	1971
Skapetis Jenny	1972
Skidmore Matthew	944
Slight J.	1973
Slivczywski Paul	1392
Sluiter Adam	942
Smart John	665
Smenda Beryl	1975
Smenda Greg	1974
Smith A.J.	182
Smith B.M.	479
Smith Brad	1233
Smith C.P.	1067
Smith Celia	995
Smith Colin G.	553
Smith David	1396
Smith Ian	1232
Smith John E.	1276
Smith Ken	2296

Name	Sub no
Smith Michael	1394
Smith P.S.	69
Smith Paul C.	1277
Smith Ron	1393
Smith W.	1110
Smock Clark	1033
Snow Doug	839
Snow Gavin R.	351
Snowden Kevin	1302
Soeto Kin	2236
Sokor Don	2297
Solopitas Jim	1976
Sortino Paul	1977
Spafford John	2237
Spasovski C.	1980
Spaven J.W.	L23
Speakman Robert	1395
Spence Anthony	L100
Spiby Andrew	1978
Spitaleri Salv	1180
Spiteri Charles	1979
Spiteri Mick	702
Spyrou Michael	2237
Stafford Don	1172
Stafford Lyn	1173
Stankoski Gordon	1202
Stantiaris Tommy	2337
Stanton Jamie	261
Stapleton Kate	L92
Stav Steve	943
Stavrou	1418
Steel Ian	1142
Steele Gary	1987
Stegley & Scally Lucy & Brian & Anne	247
Stella Joseph	1984
Stenner B.	91
Stephen Paul	1981
Stephens Charles	814
Stephens Margaret	810
Stephenson Irene	L79
Stephenson R.A.	L80
Stern Norm	1430
Stevens Jo	638
Stevens M.I.	706
Stevenson Jonathon	542
Stevenson Kenneth	429

Name	Sub no
Stevenson Phil	1985
Stewart Barry	824
Stewart June	2273
Stockton Philip	1029
Stokes Graham	2239
Stokes J.	859
Stone G.E.	1982
Stoppa Laurie	945
Storey Melissa	768
Storto Sam	1986
Stratford L.	1007
Stratford Viv, Damien & Bernard	721
Strauss Reinhard	1060
Strickland E.H.	2106
Strickland J.L.	2107
Strickland R.	2108
Stronglos John	1988
Stroud J.	L50
Stubbs William	2240
Stuber John	1471
Sturrock Garry	1983
Styles H.	1990
Styles Mark	1989
Sumarac A.	1991
Summers Gary	758
Sung Oh Jae	1992
Sutherland Warren	1094
Sutton Colin	1993
Swarbrick John A.	493
Sydow E. & M.	583
Tabacco John	1998
Tabone Celie	346
Tabone Henry	417
Tamburro A.	2000
Tan K.P.	1994
Tangey Chris & Louise	694
Tannahill Colin	946
Tanner Andy	2241
Tanner Norm	2344
Taranto Sam	128
Taranto Steve	127
Taylor Bruce	1997
Taylor C.	L40
Taylor Duncan	2242
Taylor George	562
Taylor James	1297

## Appendix 1: Submissions from individuals (continued)

Name	Sub no
Taylor Kimberly	1176
Taylor Len	1999
Taylor Matt	827
Taylor Pam	2243
Taylor Stephen	1996
Taylor Yvonne	715
Tazieks C.	1995
Teasdale Ian	970
Teasdale V.E.	1062
Tedcastle W.	2
Tesoriero Steve	1397
Teuma John	1278
Theo Dan	2005
Theophanous Theo	2001
Thomas A.	1
Thomas Anthony	L87
Thomas Barry	L27
Thomas C.	L3
Thomas Lindsay	1398
Thomas Paul	2003
Thomas Ray	L26
Thomas Tom	2298
Thompson Arthur	262
Thompson Greg	698
Thompson J.	580
Thompson M.	2004
Thompson Mark	L4
Thompson Neville	227
Thompson Sarah	915
Thomson James	291
Thomson N.	579
Thomson Peter	153
Thornber Roger	2244
Thorpe Gary	2002
Tillock William	2007
Tinkler G.	670
Tipping H. & R.	284
Tirchett Neil	2006
Tonin Fred	2014
Toohey Adrienne	880
Toohey Narelle	879
Toohey Robert	881
Topalidis Les	1472
Torca G.	2013
Torgersen Danny	2109
Tornello Vince	2012
Torossi Walter	2008

Name	Sub no
Tortul Danny	2009
Tortul Italia	2010
Tortul Sergio	2011
Tran Cuong	2020
Tran H.L.	2019
Trapani F.	2021
Trask R.	916
Treadwell David	2245
Treble Phil	2022
Tregurtha S.	2015
Trewavis Curt	2017
Trewavis Kylie	2016
Trewin Len	1399
Trezise Mp I.	49
Tribe Graeme	679
Trickey Norm	2018
Trifonopoulos Stylianos	2246
Trikius John	2247
Trinham & Crawford-Trinham Mark & Fiona	1028
Truscott Ivan	390
Tsiakmakis Nick	2023
Tsonis Peter	2024
Tsuchida Susan	1014
Tucker Neil	685
Turner Andrew	L53
Turner Gary	1300
Turner Roy	311
Turvey Mark	2248
Turville P.	2025
Turville Robert	947
Tutt James	L103
Tyers Bessie	432
Tyrrrell Julie	1115
Tzifos Con	2026
Urquhart Leanne	334
Urquhart Ron	335
Valenjit Fedele	2031
Vallay Andrew	2029
Van	2032
Van Unen Lynette	2263
Van Vliet John	268
Vandeligt Anthony	1400
Vandeligt Glenn	1401
Vandeligt Luke	1402
Vanderkram Keith	2030
Vanschyndel Ward	1279

Name	Sub no
Varcoe R.	233
Vasilevski Josif	2027
Vasilik Michael	2028
Vaughan Pat	895
Vavladellis Con	1475
Vegh F.	2033
Velardo Tony	964
Venn Alan	2034
Verga Joe	2036
Vergis Steve	2035
Vergoli E.	1207
Vesco Gino	446
Vesco John	447
Videion Hugh H.	L72
Videni Louise	495
Vigliotti C G	2039
Villani Mark	2037
Virgona Dawn	897
Virgona Frank	898
Virtue A T	2038
Visilik Michael	969
Vogel John	1419
Volonbello Ben	2041
Voss Ivan	899
Voss Lynette	896
Voulgaris Peter	2040
Wadsworth Steve	1009
Waixel Stephen	2249
Wakefield David G.	1473
Wales Mathew	962
Walker Andrew	1023
Walker Col	674
Walker Craig	543
Walker Greg	948
Walker James	1230
Walker Jason	377
Walsh B.	467
Walsh Kale	2299
Walsh Kerry	1304
Walton Anthony	816
Wandersmith Leo	2044
Ward Andrew	2045
Ward Fred G.	218
Ward J.	2042
Ware Chris	1280
Ware Janis	1281
Ware Seana	1282

Name	Sub no
Ware Steven	1008
Warfe Len	192
Warneke J.	45
Warrant N.	786
Wartnaby Chris	2250
Waspe Margaret	2261
Waters Leonard	2043
Watson Dennis	1047
Watts Bruce	1161
Webb David	2047
Webb Margaret	1293
Webster S.	L97
Weedon Robert	129
Weir David R.	2338
Weir Ian	466
Weir Jeff	624
Weir Warren	L1
Welding P. & S.	2266
Wells B.	2046
Welsford David	1403
Welsford Pam	1074
Wentzel B.	2048
Wescott Geoff	693
Wesolowski John	1119
Wesolowski Steven	1121
Wesolowski Trent	1120
Westaway Glen	2049
Westney John	2254
Wheatley J.	917
Wheatley John	805
Wheatley R.J.	978
Wheeler D.	919
Whitaker A.	2051
White Peter	2251
White Peter	433
White William	2050
Whitelaw Anthea	631
Whiteway Bob	173
Whitfield John	2339
Whitford Andrew	278
Whitford Heath	1203
Whittaker K.F.	16
Whittam B.	581
Whittam F.	918
Whittam & Nicholls W. & N.	920
Whittingham Ron	152
Whyte Stephen	1404

### Appendix 1: Submissions from individuals (continued)

Name	Sub no
Wickett Peter	2062
Wiggins Craig	828
Wignall Clint	117
Wignell Glen	1231
Wilkins F.B.	582
Wilkinson Colin	2052
Wilkinson Edward	302
Wilkinson Graham	2253
Wilkinson R.L.	340
Wilkinson Rae	316
Wilkinson Ray	402
Wilkinson Stuart	1198
Will Phillip	2057
Williams D.M.	2304
Williams G. & S.	922
Williams Ian	2056
Williams Ian	1002
Williams M.	921
Williams Nick	2055
Williams P. & D.	1137
Williams Patricia	2061
Williams Peter	2060
Williams Robert	2255
Williamson Allan	1156
Williamson Kylie	1160
Williamson Michael	949
Williamson Ron	560
Williamson Ross	985

Name	Sub no
Willmott Colin	1031
Willmott Pamela	977
Wilson D.	1420
Wilson G.	8
Wilson Geoff	648
Wilson Juliet	772
Wilson K.	840
Wilson Loch	476
Wilson Robin	644
Wilson T.	2053
Wing Brendan	2258
Winstanley Ross	1164
Wirth Gerry	2058
Wirth Vince	1735
Wise Christopher	2257
Wise Ken	2256
Wishart R.	2054
Wissell E.	2059
Withers Philip	2252
Wittick Ros L.	303
Wloch Darren	2063
Wloch Mark	2064
Wolfe Ross	2066
Wong Neil	389
Wood & Family Anthony	1071
Wood Dianne	1182
Wood Mark	2259
Wood R.	2068

Name	Sub no
Wood-Ingram Jill	1045
Woodhouse E.	2067
Woodhouse Norm	2065
Woolley Carol	662
Woolley John	1032
Worboyes Lynda	1405
Worboyes Neil	1406
Wright Al	1204
Wright Andrew	2301
Wright Arthur	2340
Wright Daniela	1206
Wright J.	2069
Wright Mark	951
Wright Michael J.	186
Wright Phillip	2070
Wright Ray	2071
Wright Russell	950
Wright S.	2300
Wright Tania	1205
Wykes Clint	2072
Wylie Jenny	976
Xuereb Alfred	2073
Yaloussis Theo	2074
Yelland R.	860
Yin Greg	2076
Yin Rod	2075
Young C.V.	59
Young David	2303

Name	Sub no
Young K.	1146
Young Ron	807
Young Stephen	2077
Young Tom	1474
Zabielsk Richard	2087
Zahir T.	2081
Zakhour Tony	2083
Zammit Chris	2085
Zammit Darren	2084
Zammit David	2086
Zanca Sam	203
Zarifis J.	2082
Zeine E.	2088
Zerafa Michael	2089
Zimmer Steven	1143
Zinnenburg C.	94
Zivkovic Miladin	2090
Zolziech Arthur	2091
Zoroje Boris	2092
Zufty Clarrie	2093
Zurawiecki Ben	2079
Zurawiecki Jan	2080
Zurawiecki Julie	2078
Zuydwyk Johannes	1305

Note: Submissions received with no name or where the name was illegible are not included. Some submissions were in the form of signed petitions.

## Appendix 2

### ECC's response to major issues

Throughout the investigation, the ECC has carefully considered all submissions and views expressed. At each stage of the LCC and the ECC investigation these views have been summarised in relevant reports. This section summarises only the major issues raised after the release of the Draft Report in December 1999, and Council's response to these issues. Key issues raised through the investigation are also addressed.

#### Establishment of highly protected marine national parks areas

Many submissions from the recreational and commercial fishing sectors believed that marine parks were only necessary where there was inadequate fisheries management and that this was not the case for Victoria. The view was expressed that appropriate regulation of the commercial and recreational fishing sectors would be sufficient to protect fish stocks and all other values. No-take areas were considered particularly inappropriate for protection of highly mobile fish. There was low acceptance by many (but by no means all) recreational and commercial fishers of the need to set aside representative areas in as undisturbed a state as possible for future generations. These fishers did not generally distinguish between the objectives of biodiversity protection and fisheries management.

Other submissions supported the creation of highly protected areas for biodiversity protection. They commonly stressed the need for large areas within which natural ecological processes could occur. They also saw no-take areas as imperative in

sustaining depleted fish stocks. Many submissions proposed specific areas for no-take areas along the coast. Most conservation groups and scientists believed approximately 6% of Victoria's waters to be an inadequate proportion of the marine environment to be set aside free from extractive uses, although most conceded it was a good start. Many believed that the marine protected areas system should incorporate larger marine national parks and sanctuaries and incorporate a greater percentage of the Victorian coastline to ensure the maintenance of biodiversity.

The likelihood of adverse social and economic impacts of highly protected areas on recreational and commercial fishers, associated industries and local communities and towns was often raised in submissions and consultations. The commercial fishing sector maintained that the values of commercial fisheries in some marine national parks recommended in the Draft Report were seriously underestimated. There were others who considered that highly protected areas could, in many cases, be a tourist drawcard, bringing in revenue to local economies, especially over the longer term.

#### ***Response***

The ECC strongly believes that, not only is it necessary, but that it would be irresponsible not to set aside a proportion of Victoria's marine area to be maintained in as natural state as possible (see also section below, *Multiple-use approaches to marine protected areas*). Protected areas on land, such as national parks, established to preserve representative examples of ecosystems in perpetuity, have long been accepted by the community as a key component in the overall good management of the environment. In Victoria, approximately 15% of land is in highly protected parks or conservation reserves.

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The ECC believes that where implementation of recommendations for marine national parks and marine sanctuaries may result in displacement effects on adjoining fished areas as fishers shift effort to accommodate the new restrictions, or where a sector of the industry or a local community is disproportionately affected, industry adjustment may be required (see Recommendation R1 on page 15 of this report). The ECC acknowledges that there are social and economic implications arising from the establishment of highly protected areas and has responded to concerns regarding specific areas by reassessing the commercial fishing estimates in consultation with industry (see sections 1.5, 2.6 and Appendix 5), and altering some locations and boundaries of recommended marine national parks and sanctuaries in order to minimise social and economic impacts. In particular, changes from the Draft Report were made to reduce the impact on Central Zone commercial abalone fishing and recreational fishers (see tables on pages xiv and xvi of the Executive Summary).

### **Multiple-use approaches to marine protected areas**

In recent discussions with stakeholders and in many submissions from the commercial and recreational fishing sectors, the ECC was questioned about why it was proposing to recommend highly protected areas, instead of multiple-use parks in which harvesting is allowed to continue in much or all of the area. A belief was often expressed that fishing and harvesting activities do not harm the environment and that a multiple-use management regime can therefore be effective in meeting conservation objectives. Other comments were made that protected areas will be ineffective in protecting highly mobile fish species, and that other impacts on the marine environment are so great as to make establishment of marine parks futile. It was frequently said that the marine environment should be managed as a whole and that it is unnecessary to “lock up” areas as marine national parks.

However, the ECC also received consistent input from commercial and recreational fishers that large multiple-use parks were not viewed favourably, largely because of the perceived potential for future restrictions on fishing, but also because of the difficulty of communicating complex regulations restricting various categories of fishing in different parts of the park.

Conservation and environment groups also criticised large multiple-use parks because of the perceived absence of clear conservation objectives and measures for the areas. Existing multiple-use parks such as Corner Inlet were sometimes cited as evidence of the lack of clear management intent. Some scientists commented on the difficulty of assessing the performance of large multiple-use parks. The overwhelming number of submissions supporting marine protected areas endorsed the system of “no-take” areas, in preference to multiple-use parks.

### ***Response***

There is an ongoing global debate about the relative merits of highly protected areas and multiple-use areas. Much of the dispute arises from the misconception that these are two fundamentally different approaches. In fact nearly all large multiple-use marine parks encapsulate highly protected zones, which form the core of the park; for example, a proportion of the Great Barrier Reef Marine Park is designated as highly protected Marine National Parks Zones. This approach leads to essentially similar outcomes to the system proposed in this report.

Australia’s Oceans Policy is often cited in support of the multiple-use approach. Nowhere, however, in the Oceans Policy is it stated or even implied that multiple uses of the oceans means that all areas are available for all industries all the time. In fact, not dissimilar to National Forests Policy, the Oceans Policy explicitly states that “multiple use planning and management of the oceans should incorporate as a central component a comprehensive, adequate and representative national system of marine protected areas.” One of the Commonwealth Government’s commitments in the Oceans Policy is to accelerate development of the National Representative System of Marine Protected Areas, which in turn has an aim, signed off by all Australian governments, of “including some highly protected areas in each bioregion”.

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Under the comprehensive, adequate and representative system of marine protected areas proposed by the ECC, Victoria's marine environment as a whole is managed for multiple uses. Marine protected areas are only one component of marine environmental management, and the ECC highlights existing and developing programs addressing critical environmental issues such as catchment management, fisheries management, introduced marine pests and marine pollution.

The ECC is persuaded that large multiple-use marine parks, in which fishing and other harvesting and extractive uses are permitted in most of the zones, send confusing messages to the community about the purpose of the parks. In order that the purpose of the parks can be clearly communicated and the management regime simply explained and implemented, a system of highly protected marine national parks is proposed. Monitoring of the performance of the parks will also be simplified.

It is essential that the marine environment be managed as a whole, in a way that maximises benefits to present and future generations of Victorians. As on land, this may involve setting aside different areas for different uses, such as aquaculture, ports or biodiversity protection. Balanced use is achieved by having a mix of uses over the whole of Victoria's marine environment, and not by allowing every use in every area. The recommendations in this report will ensure that nearly 94% of waters will remain available for sustainable uses such as fishing, oil and gas exploration and extraction, aquaculture, ports and shipping.

Although many fishing techniques do not damage the environment, it is clear that targeted harvesting of fish or any marine species alters the ecosystem of which they are part. The only way in which these effects can be objectively assessed is to set aside areas in which there is no harvesting, for long-term comparison with harvested areas.

Some fish and other marine species are highly mobile, others less so. Even some highly mobile species have stages when they are relatively sedentary and protected areas can provide major benefits. For example, Logan's Beach near Warrnambool is a nursery area for Southern Right Whales and it is widely recognised that shallow inlets and bays such as Western Port and Swan Bay in Port Phillip Bay are critical habitat for juvenile fish. This is analogous to the situation on land where some birds that nest in protected coastal wetlands in Australia fly to and from Siberia every year.



## Scientific basis for marine protected areas

Throughout the investigation a number of issues were raised, by recreational and commercial fishing sectors, relating to the scientific basis for the recommendations. A belief commonly expressed was that recreational line fishing and some commercial fishing activities have no ecological impacts, and therefore the scientific basis for excluding them from marine parks is non-existent.

A common question is whether or not there are sufficient data to confidently make recommendations about the location of marine parks and conservation reserves. A related observation is often made that there is no scientific evidence demonstrating that marine parks are effective in protecting marine ecosystems.

### **Response**

While it is true that the marine environment is generally less well understood and documented than the terrestrial environment, a large amount of information is available in Australia to describe marine regions on their biological and physical characteristics, including habitat types and species distributions. Individual marine scientists and their professional association, the Australian Marine Sciences Association, fully supported the scientific basis of the report. In a recent global overview of marine protected areas, IUCN The World Conservation Union (1998) commented that it is a mistake to postpone action because biophysical information is incomplete, and that there is usually sufficient information to indicate whether marine protected areas are justified ecologically and to set reasonable boundaries.

There is solid scientific evidence that highly protected marine parks can play an important role in good overall marine management and protection of biodiversity and other natural values. There is also substantial documentation of the differences in diversity and abundance of fish and other marine species that emerge following the creation of highly protected areas (for reviews see References 313, 325 and 341). While much of the early research in this area was conducted in tropical ecosystems (eg see References 91, 199, 200, 322, 346, 362 and 386), there is now ample demonstration of similar effects in temperate waters such as in New Zealand, Tasmania and South Africa (eg see References 16, 32, 33, 34, 79, 80, 87, 141, 162, 293, 354, 367 and 406). In Victoria, there are almost no highly protected areas in which such research can be conducted. However even a casual underwater observation at the Popes Eye Marine Reserve (at the southern end of Port Phillip Bay), which has been highly protected for many years, will indicate that fish numbers and diversity are far greater than for comparable areas in Port Phillip Bay. Likewise, in the existing sanctuary of Bunurong Marine Park, recent monitoring data indicate the sanctuary is acting as a reserve for the male blue-throated wrasse population (Edmunds 2000).

Arguably, there is no scientific evidence that the existing level of use of the marine environment is sustainable and it is sometimes suggested that the ecological sustainability of commercial fisheries should be demonstrated before they be able to proceed. Where information is available in the form of fish catch data, the indications are that harvesting of some species is not sustainable at current levels. For example, as a result of the average size of rock lobster declining, and rock lobster egg production being a matter of concern, the need to rebuild stock to ensure long-term sustainability was identified in the Victorian rock lobster fishery (Rock Lobster and Giant Crab Quota Allocation Panel 1999).

There have been major reductions in other fish stocks for reasons that are not fully understood, such as the once major cotta fishery outside Port Phillip Bay. Recreational line fishing has also been identified as affecting marine ecosystems. For example, the major decline of populations of tiger flathead, sand flathead and the common gurnard perch in Port Phillip Bay between the early 1970s and the 1990s is linked both to recreational and commercial fishing (Hobday *et al.* 1999, and see section 3.1 for further details).



## Enforcement

A common concern expressed throughout the investigation is the belief that marine national parks will become havens for fish thieves. This concern reflects the reality that stealing fish and shellfish, in particular abalone, is a significant and ongoing problem in Victoria.

Many groups and individuals have expressed the view that the current level of field management, including enforcement, is unsatisfactory and they doubt that sufficient management resources will be made available to manage newly established marine parks. There have been frequent claims that the existing highly protected sanctuary zone of the Bunurong Marine Park has been stripped bare of abalone.

### *Response*

Illegal harvesting of marine resources is a significant problem, and in some fisheries (eg abalone) is a major threat to sustainable management of the stock. Nonetheless, there is no concrete evidence that stealing is any more prevalent in marine parks than in other areas. The argument is often put that the presence of legitimate users discourages illegal users. Once again there is no evidence that this claim is valid, and it is unclear how this would affect night-time activity when much theft occurs and legal users are mostly not present. Illegal activities are often masked as legal harvesting, and enforcement officers have stated that policing is actually simpler in highly protected areas where no harvesting at all is allowed.

Monitoring within and outside the sanctuary zone of the Bunurong Marine Park, indicates that there is no basis to claims that abalone populations in existing highly protected areas have been decimated (Edmunds 2000).

It is important to remember that field enforcement is not an end in itself, but is one of several means of ensuring compliance with regulations designed to protect the resource and the environment. Education and changing community views can also be of long-term benefit in ensuring compliance.

The appropriate level of enforcement is a matter which is continually under review by the responsible agencies. A package of measures was recently introduced to increase emphasis on fisheries enforcement. All of Victoria's marine waters are subject to a complex regulatory regime (for fisheries, shipping and navigation, boating, pollution control, oil and gas extraction) which is enforced at present. However, with the introduction of protected areas, there will be additional costs associated with publicity, education and compliance, as is the case with the introduction of any new management regime, and ongoing compliance monitoring and management costs. The ECC acknowledges the strong community concern resourcing of marine compliance programs, and stresses the need to provide sufficient financial and human resources to effectively manage marine and coastal areas, both within and outside marine protected areas.

Sound, implementable and properly funded compliance programs are essential to address non-compliance, including fish theft. Consequently the ECC has recommended that implementation and management issues be addressed, including adequate sufficient resources for effective compliance and enforcement (see sections 1.5, 2.7 and recommendations R29 to R33).



## Boundary identification

Concerns have been expressed relating to the perceived difficulty in identifying boundaries at sea of marine protected areas. Many fishers, both commercial and recreational, commented on the likely difficulty in identifying boundaries, and expressed concern about the problems they thought they would experience with compliance.

For example, identifying boundaries without equipment such as the global positioning system (GPS) was considered to be almost impossible, and marker points on land and buoys at sea were thought insufficient. Concerns were also voiced that GPS would not enable accurate identification of positions with respect to boundaries or that it was too expensive.

### *Response*

While it is necessary to address issues relating to boundary marking, it is worth remembering that fishers must already comply with many regulations and restrictions which require them to identify areas at sea, such as Victoria's coastal waters limit at three nautical miles (about 5.5 km) from the coast, and major shipping channels. Approaches currently used include use of markers on the land, buoys and markers in the sea, and the distribution of maps and charts. Strong visual landscape features, depths, longitude and latitude reference and distances from shore all assist users. Electronic navigation aids such as GPS are increasingly used as their cost reduces, and enable boat-based commercial and recreational fishers to accurately determine their position.

The ECC has endeavoured to recommend boundaries that are as identifiable and practical as possible. A number of changes have been made to many areas recommended by the ECC to provide for easier identification of boundaries (see tables on pages xiv-xvi of the Executive Summary for further details).

With respect to the accuracy of GPS systems, recent changes to the system mean that positions can be relied upon to be accurate within 30 metres.

## Threats to the marine environment

Many submissions raised the issue of other major threats to the marine environment such as introduced pest species, catchment run-off laden with sediments, nutrients, contaminants and freshwater, and sewage-

linked water quality problems. It was submitted that all of these critical environmental issues cause damage and have not been adequately addressed by the ECC. Some also claimed that there was no point creating marine parks until these other problems were solved.

### *Response*

The ECC considers environmental issues such as catchment management, introduced marine pests and marine pollution are clearly in need of appropriate management. Activities such as coastal development, shipping and tourism must be planned for and managed together so they are compatible with each other and the environment. Integrated planning is essential across the whole of Victoria's marine and coastal environment, including the bays, inlets and estuaries, as well as the adjacent foreshore land and catchments that drain to the coast. Many of these issues are already the subject of targeted programs involving partnerships of government, industry and the community. For example, every sewage outfall in Victoria now has at least secondary treatment before being discharged to marine waters, and management of agricultural land to reduce erosion and fertiliser runoff is being addressed by catchment authorities, Landcare groups and regional coastal boards.

Threats to the marine environment have been addressed in detail in this report, including issues of catchment management (section 2.4), water quality (section 2.5), marine pests (section 2.5) and tourism (section 2.6).

The ECC's view is that while management of these issues is critical to the long-term health of the marine environment, there is no reason to delay creation of marine parks which in fact assist in enhancing overall management of our marine resources. It also needs to be understood that most of these problems will never be totally solved, but rather will be managed so that negative effects are minimised.



## Establishment of marine aquaculture zones

Many submissions viewed aquaculture as a mechanism for reducing pressure on natural fish stocks while conferring economic benefits on operators and the wider community. A number of submissions supported the selection criteria and principles as long as conservation principles were upheld in the planning process, but others felt that the ECC investigation was impeding the development of Victoria's aquaculture industry by not identifying suitable areas. The suitability of some areas was questioned in relation to parameters such as depth, water quality and proximity to areas of environmental significance.

Victoria has a high energy coastline and was considered by some to be generally less suitable for marine aquaculture than other states such as Tasmania with its many protected inlets and embayments.

The majority of submissions that commented on aquaculture were critical of open water systems because of the inherent environmental risks. There were many calls for tighter controls on offshore aquaculture operations, but there was clearly a strong preference for land-based aquaculture with the appropriate environmental safeguards.

### *Response*

Aquaculture has the potential to provide a wide range of benefits to the community. The development of a strong and healthy aquaculture industry is supported by the ECC. Open-water aquaculture is reliant upon the health of the surrounding environment, and it is in industry's interest to ensure that they adhere to strict environmental guidelines. Nevertheless, open-water aquaculture has inherent environmental risks which need to be carefully monitored and addressed as necessary (see section below, *Environmental issues related to aquaculture*). For these reasons, and in the response to community's strong preference, the ECC believes that a high priority should be placed on the development of land-based aquaculture (see section 4.5). Open waters, however, in appropriate situations should also be available for aquaculture.

It is a matter of some concern to the ECC that this investigation has sometimes been portrayed as an impediment to aquaculture development. In fact, the establishment of new aquaculture enterprises has been very slow in Victoria, and the ECC investigation is part of the process of facilitating marine aquaculture through nominating suitable sites. There is no doubt that delays in finalising the investigation have caused some frustration, but it is important to note that aquaculture proposals can be, and are, being dealt with under the existing guidelines prior to the Government's consideration of, and response to, the final ECC recommendations.

## Economic issues related to aquaculture

Economic issues raised during consultation and in submissions include the benefits to local communities of aquaculture operations and positive and negative impacts on tourism.

Concerns were also expressed that there may be a negative impact on tourism because of the potential visual intrusion of aquaculture farms.

### *Response*

There can be significant benefits to local economies associated with aquaculture including the attraction of investment capital, direct employment, development of support services and multiplier effects.

Tourism and local marketing opportunities also exist for aquaculture operations. Educational and information tours are run on a regular basis in aquaculture areas in other states. Submerged technologies are now available that, along with careful site selection, reduce the visual impact of aquaculture farms (also see *Environmental issues related to aquaculture* below and section 4.7).





## Environmental issues related to aquaculture

A number of environmental issues related to aquaculture were repeatedly raised throughout the investigation. In fact environmental risk was the most often cited concern. Some sites such as the sensitive inlet environments of Western Port and Corner Inlet (Ramsar areas) were considered by many to be highly inappropriate for aquaculture. Other sites were considered unsuitable due to proximity of industrial port facilities, shipping and boating traffic, and associated anti-fouling compounds. Concerns also were expressed about:

- the potential for introduction of diseases;
- transport of exotic animals and plants;
- impacts on marine communities beneath aquaculture farms;

- predator interactions with fish farms;
- increased nutrients; and
- the visual impact of aquaculture operations.

Concern about the risks of introducing diseases or exotic species through aquaculture of marine species was strongly expressed.

A potential environmental benefit that was often raised during consultation was that aquaculture would reduce pressure on wild fisheries, for example, on the declining wild snapper fishery. Some suggested that shellfish farms have minimal environmental effects, adding that they have the potential to reduce nutrient (especially nitrogen) concentrations in marine waters.

### **Response**

The ECC believes that the strong community concerns about environmental sensitivity of the Ramsar-listed Western Port and Corner Inlet environments are justified and consistent with the ECC's principle that aquaculture development should generally not be permitted in or adjacent to sites with significant environmental values, including sensitive or threatened habitats. For these reasons and in view of the fact that the nominated sites were not strongly supported by the industry, the ECC decided to remove them from recommendations (see table on page xvi of the Executive Summary). The new Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* increases the scrutiny that new developments such as marine aquaculture operations will undergo if they are proposed to be located in sensitive environments such as Ramsar wetlands. The new Act requires determining whether any activities are likely to have a significant impact on wetlands of international importance (as one of the six matters of national environmental significance). Any such proposals must be referred to the Commonwealth Environment Minister for determination as to whether the proposal is a controlled action and requires Commonwealth approval.

To the widely-expressed concern about the risks of introducing diseases or exotic species through aquaculture of marine species, the ECC has responded by adopting an additional principle for selection and management of marine aquaculture areas (see section 4.5). Prevention of introduced diseases will be addressed in AQUAPLAN, which is being developed by the Commonwealth government and the aquaculture industry. Risks associated with imported feed are subject to Import Risk Analyses (IRAs) to be developed by AQIS for processed aquatic animal feeds, aquatic meals and other aquatic animal products (see section 4.7, recommendation R44). The translocation of exotic animals and plants and non-indigenous stock will be covered in the Victorian Translocation Policy (see section 4.7, recommendation R42). Specific local issues, for example the translocation of exotic animals from Port Phillip Bay to Western Port, is being addressed by protocols being developed by Fisheries Victoria, and the Marine and Freshwater Resources Institute is currently assessing effective treatment of mussel spat ropes to rid them of fouling organisms and exotic species.

The Victorian Aquaculture Strategy (1998) outlines monitoring procedures to be followed for aquaculture operations including baseline studies. With effective monitoring and appropriate management, including fallowing, the impact on flora and fauna beneath aquaculture farms, while it could be significant in the short term, should be negligible in the longer term. Monitoring of aquaculture operations has been addressed in detail in the recommendations (see section 4.7, recommendation R43).

*Continued next page*



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Predator interactions with finfish farms are of two kinds: (a) predator entanglement in nets; and (b) fish stock losses through stress due to the proximity of predators, predator entry to the stock enclosure, or stock escapes through damaged nets. Potential predators in Victoria are sharks, Australian fur seals and dolphins. Heavy gauge predator nets surrounding fish pens are used in other states to prevent predator attacks, and advice to the ECC indicates that these systems are effective. The Marine Animal Interaction Working Group workshop, convened by the South Australian Department of Primary Industries and Resources, has developed reporting procedures for cases of predator attacks and entanglement. Advice from Fisheries Victoria and industry is that problems related to predator entry to, or entanglement with, finfish farms are now virtually non-existent due to upgraded enclosure systems.

It is Victorian Government policy – through the State Environment Protection Policy, Waters of Victoria, to reduce nitrogen inputs to Port Phillip Bay by 1000 tonnes per annum (approximately 15%) by 2006. Because finfish farming in the bay would require supplementary feeding (which would result in increased nitrogen input), the establishment of any proposed farms would need to be done with caution. The conditions of nutrient management and finfish culture in Port Phillip Bay, both on a trial basis and as commercial operations, are discussed in detail (see section 4.4) and have been addressed in recommendation R40.

Fisheries management plans for aquaculture zones will address the issue of visual impact, but experience in other states indicates that with appropriate site selection visual impacts are generally minor. This has been demonstrated even in highly scenic environments such as the Derwent estuary in Tasmania. The ECC has responded to community concerns, however, where visual amenity was a critical consideration. For example, the Waratah Bay aquaculture zone was removed from the final recommendations because of the potential visual impacts, amongst other reasons (see table on page xvi of the Executive Summary).



## Planning issues

Many planning and procedural issues have been raised in relation to preferred areas for marine aquaculture. Siting of aquaculture zones, their sizes, whether or not aquaculture should be permitted in

marine parks, and potential conflicts with recreational boating, and commercial and recreational fishing, are some of the frequently raised points. Many considered that access for fishing and recreational boating would be reduced by aquaculture farms.

### ***Response***

The proposed aquaculture zones were developed with the input of industry, Fisheries Victoria and community groups. The recommended areas are those that best meet the needs of all groups. New technologies exist for open ocean sites which offer potential for Victoria. However investors need to develop confidence with this technology, and there is limited availability for sheltered sites because of existing uses or environmental reasons (see section Establishment of marine aquaculture zones and above).

A number of aquaculture investigation areas (relatively large areas where further investigation was required) were recommended in the Draft Report. None have been recommended in this final report. In most cases further evaluation has been carried out and, together with input from industry and the community following release of the Draft Report, the ECC has decided that the site does not have any immediate potential, or a smaller aquaculture zone is recommended within the former investigation area. Aquaculture zones are areas that have demonstrated successful aquaculture performance or growth of target species in the past or, on advice from Fisheries Victoria and industry, will almost certainly be suitable for target species (for details of changes see table on page xvi of the Executive Summary).

Zones have been chosen in areas where conflict with other uses is minimised, and aquaculture is not allowed in the fully protected marine national parks or marine sanctuaries.

Recreational boating and fishing will be allowed in aquaculture zones provided that the aquaculture operation is not adversely affected (see section 4.7, recommendation R46). Commercial fishers are unlikely to be significantly affected by the proposed aquaculture zones. Consultation with the responsible navigation authorities has determined the level of risk to commercial shipping and recreational vessels to be low provided aquaculture operations are marked clearly and notice is given to mariners.



## Appendix 3



Mirimbiak  
Nations  
Aboriginal  
Corporation



# OUTCOMES OF CONSULTATION WITH VICTORIAN ABORIGINAL COMMUNITIES ON THE ECC MARINE, COASTAL & ESTUARINE INVESTIGATION DRAFT REPORT (1999)

REPORT TO THE ENVIRONMENT CONSERVATION COUNCIL

MAY 2000



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**Please Note:**

*The final report from Mirimbiak Nations Aboriginal Corporation (Mirimbiak) also contained specific recommendations related to recommended areas in the ECC Marine, Coastal and Estuarine Investigation Draft Report. These comments are not included in this appendix but have been addressed in the area specific recommendations of the ECC's Final Report.*





## Consultation process

Following the release of its Marine, Coastal and Estuarine Investigation Draft Report in December 1999, the ECC wrote to the relevant native title claimant groups, regional cultural heritage program co-ordinators and Aboriginal communities (lists were provided by Aboriginal Affairs Victoria (AAV) and Mirimbiak) requesting their input on the draft recommendations. One response was received.

In order to ensure Aboriginal participation in the public consultation process, the ECC met with representatives from AAV, ATSIC (Vic) and Mirimbiak to determine an effective way to consult with Aboriginal people in the investigation area. As a result of that meeting, the Environment Conservation Council (ECC) commissioned Mirimbiak to facilitate consultation with Aboriginal groups along the Victorian coast. Mirimbiak is recognised as being a central contact point as it is the native title representative body (NTRB) for Victoria and peak advocacy group for Aboriginal people in Victoria. Mirimbiak selected a facilitator, Janelle Everitt, to perform the following tasks over a six week period from mid April to the end of May 2000:

- consult with appropriate Aboriginal people and groups (see below);
- meet with ECC staff to provide an oral progress report;
- workshop the outcomes of the consultation process, and include representatives from AAV, ATSIC (Vic) and the ECC; and
- prepare a written report for ECC.

### Invited groups

All groups from the Victorian coast were invited to submit comments through the consultation process, and efforts were made to ensure that everybody was represented during the consultation process. The people who were invited to attend were:

- traditional coastal owners;
- native title claimant groups;
- relevant cultural heritage officers; and
- relevant community organisations.

### Communities involved in Consultation

Aside from specific claimants, representatives from the following Victorian Aboriginal coastal communities (VACC's) were invited to provide comments on the draft report.

- Boonerwung Land Council
- Central Gippsland Aboriginal Health and Housing Cooperative Ltd
- Framlingham Aboriginal Trust
- Far East Gippsland Aboriginal Cooperative
- Gunditjmara Aboriginal Cooperative
- Lake Tyers Aboriginal Trust
- Kerrup Jmara Elders Corporation
- Moogji Aboriginal Council East Gippsland Inc.
- Ramahyuck District Aboriginal Corporation
- West Gippsland Aboriginal Community Cooperative
- Winda-Mara Aboriginal Corporation
- Wathaurong Aboriginal Cooperative Ltd
- Wathaurong Traditional Owners
- Wurundjeri Tribe Land Compensation and Cultural Heritage Council Incorporated



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### **Cultural heritage programs**

The following cultural heritage programs were also consulted:

- South West & Wimmera Cultural Heritage Program;
- Kulin Nations Cultural Heritage Program; and
- Gippsland & East Gippsland Cultural Heritage Program.

### **Documentation**

The following documentation was available to all involved in the consultation.

#### **Marine Coastal and Estuarine Investigation (MCEI) Draft Report for Public Comment**

Copies of this document were provided by the ECC.

#### **Marine Coastal and Estuarine Investigation Brochure**

This brochure was also provided by ECC. This displayed the recommended areas on a map and a brief summary of what the investigation involved.

#### **Mirimbiak MCEI Summary paper**

This summary paper contained the following information to provide a clearer outline of the investigation:

- Who is the Environment Conservation Council (ECC)?
- What is Mirimbiak's role in the investigation?
- The investigation process so far
- Who is affected by the ECC investigation and who should be involved in the consultation process?
- What is your group's role in the investigation?
- What happens after the consultation?

All attendees received a copy of this paper at the workshops.

#### **1994 LCC consultation with Victoria's coastal Aboriginal communities paper**

This paper was written in 1994 by Collon Mullet for the Land Conservation Council (LCC), after consultation with Victoria's Aboriginal coastal communities, in response to a previous draft report. This paper was reviewed by the relevant groups to determine its relevance to today.

#### **1995 LCC consultation with Victoria's coastal Aboriginal communities paper**

This paper was written in 1995 by Collon Mullet for the LCC, after further consultation with communities following the release of LCC marine and coastal draft recommendations. This paper was also reviewed by the relevant groups to determine its relevance to today.

**Also available to Mirimbiak were copies of written submissions made to the LCC and the ECC by various Aboriginal communities and peak groups throughout the nine year investigation.**



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## Workshops

Workshops were held with various Victorian Aboriginal groups from 19<sup>th</sup> April 2000 to 19<sup>th</sup> May 2000. The same agenda was followed for all workshops.

<b>Agenda Item</b>	<b>Objective</b>
<b>Investigation Overview</b>	To increase knowledge of the investigation and what has been involved
<b>Review of LCC consultation paper 1994</b>	To review and verify the current relevance of the issues raised in the LCC consultation paper.
<b>Review of LCC consultation paper 1995</b>	To review and verify the current relevance of the issues raised in the second LCC consultation paper.
<b>Review MCEI Draft Report</b>	To review the recommendations (site specific) in the ECC Draft Report.
<b>Protocol for implementation of recommendations</b>	To identify protocols in which Aboriginal interests are incorporated in the implementation of State government approved recommendations.

### Workshop timeline

The following workshops were held throughout Victoria. Due to time constraints, Aboriginal people could not be consulted on an individual basis. This made it difficult to address all individual issues and recommendations.

MTG001	MCEI CONSULTATION – GUNDITJMARA	19/04/00
MTG002	MCEI CONSULTATION – WATHAURONG CO-OP	04/05/00
MTG003	MCEI CONSULTATION – GUNAI-KURNAI	05/05/00
MTG004	MCEI CONSULTATION – WATHAURONG TRADITIONAL OWNERS	01/05/00
MTG005	MCEI CONSULTATION – WURUNDJERI	15/05/00
MTG006	MCEI CONSULTATION – KERRUP-JMARA	03/05/00
MTG007	MCEI CONSULTATION – BOONERWRUNG	05/5/00
MTG008	MCEI CONSULTATION – KULIN NATIONS CULTURAL HERITAGE	12/05/00
MTG009	MCEI ECC & MIRIMBIAK MEETING	09/05/00
MTG010	MCEI VACC GROUP WORKSHOP	19/05/00

### VACC's group workshop

At the request of some coastal Aboriginal communities, a workshop was held for the VACC's to come together and discuss a submission to the ECC. Two representatives from all of the VACC's were invited to attend. All groups were represented by the attendees. This allowed the VACC's to emphasise the importance of consultation to the ECC. Representatives of the ECC were also in attendance to answer any questions raised by the attendees.



## VACC's statement

The groups represented at the VACC's workshop on the 19<sup>th</sup> May agreed to make the following statement and asked that it be included in the report to the ECC.

*"Detailed recommendations could not be provided as there was too little time and a lack of resources for further investigation into the recommendations for the Draft Report. Victorian Aboriginal communities are dissatisfied about being consulted at the end of processes which have already been signed off by the Government and non-government organisations. It is a breach of legislation to do this and organisations should be made aware of this situation. When legislation is breached the Government must ensure that penalties are enforced.*

*If the Government continues to deny the Aboriginal people of their culture and interests there will be a continuance of illegal and unacceptable activities which will have a detrimental and destructive effect on:*

- *Aboriginal culture;*
- *the environment; and*
- *the reconciliation process.*

*The Government and relevant organisations must not allow this destruction to continue. All parties who share an interest in the land and water should share the same view."*

## Legislative framework

It was decided that the legislative framework should be stated at the beginning to emphasise the importance of the legislation that is currently in place, specifically in relation to consultation and implementation processes. The following are examples of current State and Commonwealth legislation:

- *Native Title Act 1993 (Cth);*
- *Aboriginal Torres Strait Islander Heritage Protection Act 1975 (Cth); and*
- *Archaeological & Aboriginal Relics Preservation Act 1972 (Vic).*

\* Common law may also be useful in identifying the rights and obligations of Aboriginal coastal communities and traditional owners.

### **Aboriginal And Torres Strait Islander Heritage Protection Act 1984 - Section 4**

The purposes of this Act are the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginal people in accordance with Aboriginal tradition.



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### **The Archaeological & Aboriginal Relics Preservation Act 1972**

Archaeological areas are protected by State legislation (*The Archaeological & Aboriginal Relics Preservation Act 1972*). The Archaeological Relics Advisory Committee advises the Government about the preservation of relics and areas. Aboriginal sites are also protected under the Commonwealth Act – the *Aboriginal Torres Strait Islander Cultural Heritage Protection Act 1975*.

If a person wilfully defaces or damages or otherwise interferes with a Aboriginal object or place, penalties have been put in place, the following maximum penalties may apply:

#### Under Commonwealth Legislation

1. - Individuals; there is a fine of \$10,000 and or imprisonment for 5 years.
2. - Corporate Bodies; a fine of \$50,000 and or imprisonment for 5 years,

#### Under Victorian Legislation

3. a fine not exceeding \$1000 and or not more than three months imprisonment. A person can be imprisoned for a number of different offences relating to Aboriginal archaeological relics and areas.

### **Native Title Act - Future Act Regime**

Government and non-government organisations must be aware that under the Native Title Act's Future Act regime there are obligations to notify, receive and consider comments and in some cases, negotiate with Aboriginal people in relation to acts which may affect native title. While the obligations under the Native Title Act may vary according to the type of activity proposed, whether the area to be affected is land or sea and the tenure of the area to be affected, the basic proposition is that Aboriginal people must be consulted about activities proposed to be undertaken on their traditional lands and/or waters.

The VACC's consider that 'best practice' consultation would necessarily involve comprehensive notification and negotiation towards an agreement between the relevant community and the proponent such that the activity may proceed.

In the event that the obligations under the Native Title Act are not observed, activities are 'invalid' to the extent that they effect native title. This means that the proponent does not have the certainty that they can proceed with their proposals if they do not observe this legislation.

Below is the list of the relevant Future Act provisions in relation to marine, coastal and estuarine land and waters, which will need to be observed in order that activities are valid under the Native Title Act.

The provision of primary importance is:

#### **Section 24HA (management of water and airspace)**

*This section applies to a future act consisting of the making, amendment or repeal of legislation in relation to the management or regulation of:*

- (a) surface and subterranean water; or
- (b) living aquatic resources; or
- (c) airspace.



*In this subsection, "water" means water in all its forms and "management or regulation" of water includes granting access to water, or taking water.*

*Leases, licences etc.*

*(2) This section also applies to a future act consisting of the grant of a lease, licence, permit or authority under legislation that:*

*(a) is valid (including because of this Act); and*

*(b) relates to the management or regulation of:*

*(i) surface and subterranean water; or*

*(ii) living aquatic resources; or*

*(iii) airspace.*

*In this paragraph, "water" means water in all its forms and "management or regulation" of water includes granting access to water, or taking water;*

### **Additional Provisions**

The following provisions may also be relevant:

- Section 24FA (future acts where procedures indicate absence of native title);
- Section 24IA (acts involving renewals and extensions etc. of acts);
- Section 24JA (acts involving reservations, leases etc.);
- Section 24KA (acts involving facilities for services to the public);
- Section 24LA (low impact future acts);
- Section 24MD (acts that pass the freehold test--but see subsection (5); and
- Section 24NA (acts affecting offshore places).

### **Communication of legislation**

It is imperative that Government notify organisations of legislation that must be adhered to. The Government must also communicate to organisations the relevant Acts and the penalties that can be enforced when breaching these Acts.

These Acts provide for regimes whereby Victorian Aboriginal people take part in the preservation of their cultural heritage by being members of committees that advise Ministers, as inspectors with wide-ranging powers, and as members of Aboriginal community organisations that are responsible for managing cultural heritage issues within their areas. Unless the ECC can propose a similar regime for the management of marine and coastal issues, then Aboriginal people will not have a say in caring for their country.





## General recommendations

The following recommendations have been collated as a result of consultation with Aboriginal groups and communities. Detailed recommendations could not be provided due to the various limitations of the Aboriginal groups and communities, both in terms of time and resources.

## Consultation

Continuing consultation on decisions regarding marine and coastal areas has been identified as a major priority. Consultation processes so far have been interpreted by the VACC's as 'tokenistic', mainly due to their experiences (past and present) of consultation between various Government agencies and Victorian Aboriginal people; for example, during the Regional Forest Agreement processes. Unfortunately, Aboriginal people and communities have been required to take part in these consultation processes:

- in their own time;
- with little/no resources;
- in extremely limited time frames; and
- with limited information.

Detailed recommendations are unable to be given under these circumstances. The Government and relevant organisations do not take Victorian Aboriginal communities recommendations and requests seriously. No formal responses have been provided to previous submissions to the LCC/ECC, or recommendations implemented. There was little indication in the ECC Draft Report that recommendations from the 1994/1995 Mullet reports had been considered.

Despite the *Aboriginal and Torres Strait Islander Cultural Heritage Protection Act 1975* and *Native Title Act 1993*, consultation has not been undertaken adequately by government agencies and other organisations. Without proper (and early) consultation Aboriginal culture and the environment are being destroyed throughout Victoria's land, marine, coastal and estuarine areas. Without direct consultation, fair and effective protocols and policies cannot be achieved.

Organisations constantly request input with extremely limited timeframes. These timeframes prevent Aboriginal groups and communities providing detailed recommendations. This period of consultation, on the Marine, Coastal and Estuarine Investigation Draft Report, has been conducted over a six week period and was meant to include Aboriginal communities along the entire Victorian coastline (SA border to NSW border). This time period was clearly insufficient to produce detailed recommendations signed off by all communities.

Development can have a devastating effect on Aboriginal cultural heritage sites. Recognition is not given to the need for Aboriginal input and involvement in the process of planning and implementation. Generally there are no specific provisions for Aboriginal consultation or involvement in these processes. All VACC's agree that any planning and development by any organisation (State,



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Commonwealth, private and public) must involve consultation with the relevant VACC before decisions proceed.

In summary:

- Not enough time was available for this ECC consultation. Site visits and additional information needs to be available for accurate decisions to be made.
- Further consultation should be held directly between the Government and Victorian Aboriginal groups and communities on future decision-making, planning and implementation processes.
- Consultation protocols should be developed between Government, marine and coastal management bodies and Aboriginal groups and communities.
- Indigenous land, marine and coastal concerns should be integrated into relevant Commonwealth and State legislation. This is a fundamental objective of the *Aboriginal Torres Strait Islander Cultural Heritage Protection Act 1975* which should be adhered to along with the roles and responsibilities of the cultural heritage officers and inspectors.
- All organisations involved in land and water management must work together with Aboriginal communities to achieve these common goals. This cannot happen without effective communication and consultation. Dealing directly with Aboriginal communities can benefit everybody. The Government needs to communicate and promote this to agencies and other organisations. It is important that protocols on a local level be established. The recognition of existing management plans on cultural heritage sites in local areas has already been established and implemented in some areas.
- It is essential that the Government encourage co-operation and negotiation between communities and other organisations with VACC's. This should include development of principles, protocols and procedures for negotiation and liaison with indigenous people, and for handling key sensitive issues. The establishment of local agreements will be to the benefit of all Victorians.



## **Aboriginal culture**

It is imperative that the social, spiritual, traditional rights, customs, practices and socio-economic opportunities (land and sea) of the Aboriginal people and their culture be recognised and acknowledged by the Government and non-government organisations.

Aboriginal culture is being desecrated and destroyed due to lack of recognition of the Aboriginal people and culture by Government and non-government organisations. Aboriginal culture is not given sufficient priority by the Government and non-government organisations. Physical and spiritual connections must not be taken away from Aboriginal people.

The Government must recognise, accept and acknowledge Aboriginal culture. The Government should promote Aboriginal culture and integrate it into future developments.

The Government and other agencies should provide information, advice and assistance on environmental concerns as they relate to management of traditional lands and waters, natural and cultural resources, and on native title.

Protection of the environment is a continued and interactive practice by Aboriginal people. The practice of land and water care is carried out by Aboriginal people because of their strong connection and sensitivity to the environment. Conservation practices by Aboriginal people contribute to the survival of Aboriginal culture and are a form of paying respect to the land and what it provides.

## **Protocols**

The Government must create and enforce legislation that provides protocols for consultation and involvement between land and water organisations and Aboriginal communities. The following protocols apply to all areas under the ECC investigation and for future areas of development.

### **Consultation**

Consultation with the relevant Aboriginal community should be part of the process for all planners, developers and management groups. Consultation protocols must be followed prior to any planning and development of any area.

### **Additional information**

For Aboriginal communities to make informed decisions, all relevant information should be provided at commencement of the process. This information should also be available upon request and adequate resources provided. The types of information which need to be provided are:

- site reports (eg. salinity levels, vegetation, visitor numbers, erosion levels etc. of the proposed site);
- any relevant archaeological surveys;
- any relevant cultural heritage surveys;



- financial statements (stakeholders, economic gains);
- licence/lease numbers and types; and
- supporting infrastructure to be developed (where, when and purpose).

Reports on a regular basis on the status of areas (eg vegetation growth, number of visitors to the area, flora, fauna and marine life status) are also important.

The request for additional information should be defined at the commencement of the project/plan before any decisions/recommendations are made. Archaeological surveys must be performed prior to any planning and development.

### **Site visits**

Site visits must be performed before a recommendation can be made, as decisions cannot be made purely in a boardroom. Site visits provide opportunities for the affected people to obtain a clearer understanding of the proposed plan/development and be able to make more informed decisions. Site visits must also be resourced by the developer and authorised by the traditional owners. This will then prevent adverse impacts on:

- Aboriginal cultural heritage; and
- the environment.

### **Resources**

Government departments (State and local) must fund Aboriginal liaison officers so representatives are in attendance at all stages of planning, development, implementation and ongoing management of any areas. It is imperative that these representatives also be recognised by other relevant organisations and resources made available.

### **Acknowledgment**

Acknowledgment of the traditional owners and the traditional names (signage) should be included in the ECC's Final Report and also throughout Victoria's land, marine and coastal areas (this educates non-Aboriginal people about the areas they are entering into and about the Aboriginal people of that area).

### **On-shore infrastructure & access**

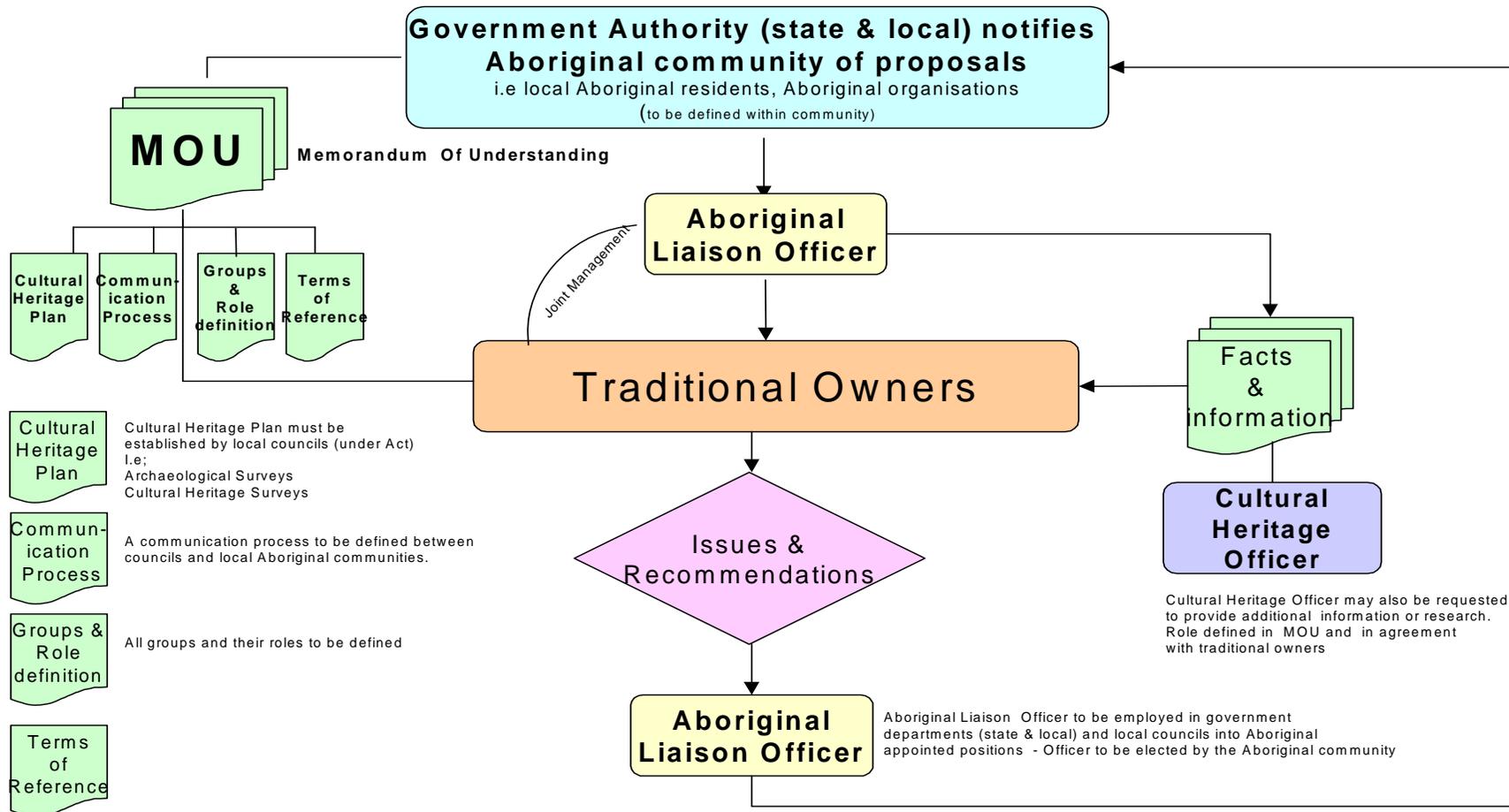
Where there is recommended off-shore areas the Government needs to provide information on any facility or infrastructure that will be developed adjacent or nearby to support these areas.

Where areas are difficult to access there needs be further investigation on the alternative methods of access; for example, Are people going off the walking tracks and over sand dunes to access these areas?



### Consultation process

The VACC's proposed a future consultation process similar to the one below. This process is already working successfully with various local councils in Western Victoria.





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## **Traditional rights**

The Government needs to recognise Aboriginal culture and integrate it into their protocols by way of amending the relevant legislation if necessary. Changes need to occur to legislation to give protection to Aboriginal people and their culture that will allow them to go onto traditional land without fear of prosecution. Recognition of Victorian Aboriginal peoples' traditional rights to access the resources for family, economic and ceremonial practices without incurring prosecution or having to acquire a permit is critical. Other states, notably New South Wales, have already given recognition to this right.

At present, Aboriginal traditional practices may infringe upon existing legislation. Aboriginal people should not be required to have a permit/licence to conduct Aboriginal practices on traditional land. Many areas recommended in the ECC Draft Report are of cultural significance and cultural practices are carried out within the immediate locations. A major traditional practice for Aboriginal culture is to respect and nurture the environment. Aboriginal people are prevented from performing this tradition due to legislative restrictions and lack of consultation and involvement from the organisations involved.

### **Access to land and waters**

Acquiring a licence to access land and waters should not be necessary given that Aboriginal people have been accessing these areas for thousands of years. Aboriginal people continue to perform traditional practices on traditional land.

## **Exploitation of knowledge sites and resources**

Despite the Section 24 notices (under the Native Title Act) submitted by various groups (such as tourism groups, Government departments, professional and commercial fisherman) focussing their activity around coastal areas, exploitation still occurs along Victoria's coastline. Not all groups are adhering to the Section 24 process. Various forms of exploitation such as the building of walking tracks, boat ramps, roads, caravan parks, toilet blocks and other various facilities are continuing. Preference and priority is given to activities of this nature without consideration of Aboriginal peoples' views about such commercial or recreational exploitation and its impact on cultural heritage within these areas.

No interpretation by Government and non-government organisations has been provided on Aboriginal occupation or their activities along coastal zones.

Virtually no areas give precedence to Aboriginal community needs and requirements over other uses and users.



## **Tourism**

Tourism is increasing in Victoria. There are far more developments being conducted for tourism purposes eg aquariums, marine parks etc. With the increase of tourism, there is higher risk of damage and destruction to Aboriginal culture.

There is significant exploitation of Aboriginal culture in tourism. Too many tourism companies are promoting and exploiting Aboriginal culture to increase their financial gains. The local Aboriginal community must be the authorising body in any instance where there is promotion of Aboriginal culture. Aboriginal people want to share their culture but also need to be able to control the promotion of it.

Any cultural interpretation (intellectual and physical) must be authorised by the local Aboriginal community.

Only Aboriginal people should be authorised to conduct traditional practices. Non-Aboriginal organisations should not be benefiting financially from something that is not theirs. Aboriginal people want to provide opportunities to negotiate with the relevant organisations.

Tourism organisations should employ Aboriginal tour guides to conduct cross cultural tours etc.

Where there is an increase in tourism (eg Bells Beach), there are detrimental effects on the environment and Aboriginal culture (sites, middens etc). Areas need to be assessed to avoid damage and destruction to Aboriginal culture and the environment. A percentage of the financial gains made from tourism could be spent on preventing the destruction of these areas.

## **Fisheries management**

Aboriginal people are excluded from being involved or participating in fisheries management. Aboriginal people must have involvement and be given opportunities for employment within fisheries.

Aboriginal people have been involved in cultivating the resources, similar in many ways to present day mariculture, for thousands of years. Managing the coastal resources plays a major role in Aboriginal peoples' survival and their conduct of ceremonial practices.

## **Land and water management**

Currently there are very few Aboriginal people involved or employed in land and water management. Opportunities for employment should be provided for Aboriginal people to work in identified positions by Government and non-government organisations. These positions should also be resourced by these organisations. For a consultation process to work effectively it is imperative that Aboriginal people are involved in the decision-making and actual management of land and water areas. It would



be futile having an Aboriginal representative if they have no impact on decisions to be made. There should also be:

- Government and non-government organisations consideration of ways in which land, marine and coastal bodies (such as the ECC and NRE) can assist in the progression towards indigenous ownership of traditional lands, waters and natural resources, eg through regional agreements;
- establishment of a land and water management structure that:
  - enables Aboriginal people to be directly involved as an equal partner
  - provides Aboriginal people with an equal share, and
  - allows direct representation in the management and use of these areas; and
- special places managed by Aboriginal people.

## Water quality

Aboriginal people have major concerns over water quality in many areas. Consultation with and involvement of Aboriginal people in developing plans for better management of catchment areas is essential along with serious consideration being given to the monitoring of the use of chemical products (and other pollutants), eg the sewage pipe running into Gunnamatta Beach.

Ecologically sustainable development is a continued practice by Aboriginal people. The healthy state of the environment is due to the effective management of the land and water by Aboriginal people. Aboriginal peoples' knowledge of balanced resource management should be identified, acknowledged and utilised.

Environmental degradation such as the devastation of water tables, silting of bays, inlets, rivers, creeks and streams have all been affected. This then filters down through the food chain (eg to small fish) and degrades the environment of the catchment areas, to eventually create the problems we now have (eg blue-green algae).

The current practice of diversion of waterways through catchments by NRE and local shires requires the involvement, direction and endorsement of local Aboriginal communities. Changing the course of water has a detrimental effect on the environment.

## Closing of rivers and lakes

Aboriginal people must be given as much right and recognition as non-Aboriginal people in making decisions regarding the resources and activities that occur within rivers and lakes throughout the State of Victoria. Examples of some strategies for rivers and lakes:

- the closing of rivers and lakes for periods of 6-12 months gives the natural resources time to rebuild their stocks and eliminates exploitation of these resources by commercial and non-commercial practices or activities;



- rivers and lakes need access to old flood plains for replenishment of their nutrients required for the natural resources that live in and around the waterways; and
- Aboriginal people have much relevant knowledge regarding the resources and activities that occur within rivers and lakes and this knowledge is currently not being utilised.

### **Land and water groups (voluntary)**

There must be direct consultation by voluntary land and water groups with local Aboriginal communities. Although the Victorian Aboriginal people support these groups' roles in conservation and environment they still need to consult directly with the Aboriginal people. They should also be required to follow consultation protocols. These land and water groups could also assist in identifying and protecting Aboriginal cultural heritage sites/areas that they may infringe upon.

### **Marine protected areas**

The implementation of marine protected areas and their objectives have the potential to obstruct Aboriginal people in the carrying out of their cultural practices. Aboriginal people should continue to be consulted in determining the location of parks. It should also be made clear where there are commercial benefits in the establishment of these areas.

### **Cultural heritage zones**

Within the Aboriginal boundaries there are areas of cultural significance that are highly sensitive. These areas should be zoned off similar to marine protected areas. These should be called Cultural Heritage Zones. There should not only be protection of the environment but protection of Aboriginal culture. The Government should introduce legislation to establish this and enforce this to all relevant land and water organisations.

### **Economic sustainability**

There should be sharing in the economic benefits in the various land and water areas, such as tourism and commercial fishing. Economic sustainability for Aboriginal people should be a priority for the Government. Sharing in the economic benefits could provide funding for programs run by Aboriginal communities such as:

- cultural heritage management;
- environmental management; and
- land and water management.



## References

ECC (1999) *Marine, Coastal and Estuarine Draft Report*. Environment Conservation Council, Melbourne.

LCC (1994) *Consultation with Victoria's Coastal Aboriginal Communities paper*. Land Conservation Council, Melbourne

LCC (1995) *Consultation with Victoria's Coastal Aboriginal Communities Proposed Recommendations paper*. Land Conservation Council, Melbourne

*Mirimbiak MCEI Summary paper*, Mirimbiak Aboriginal Nations Corporation, Melbourne.

VACCs workshop minutes.

## List of meetings

MEETING NO.	MEETING TITLE	DATE
MTG001	MCEI CONSULTATION – GUNDITJMARA	19-04-00
MTG002	MCEI CONSULTATION – WATHAURONG CO-OP	04-05-00
MTG003	MCEI CONSULTATION – GUNAI-KURNAI	05-05-00
MTG004	MCEI CONSULTATION – WATHAURONG TRADITIONAL OWNERS	01-05-00
MTG005	MCEI CONSULTATION – WURUNDJERI	15-05-00
MTG006	MCEI CONSULTATION – KERRUP-JMARA	03-05-00
MTG007	MCEI CONSULTATION – BOONERWRUNG	05-05-00
MTG008	MCEI CONSULTATION – KULIN NATIONS CULTURAL HERITAGE	12-05-00
MTG009	MCEI ECC & MIRIMBIAK MEETING	09-05-00
MTG010	MCEI VACC GROUP WORKSHOP	19-05-00

NB: Copies of minutes are available upon request from Mirimbiak Nations Aboriginal Corporation.

## Acknowledgments

Thank you to all members of the Victorian Aboriginal coastal communities who put in a great amount of time and effort into this submission with limited resources. Your participation has been essential to this process.

## Appendix 4

# Potential Social and Economic Effects of Recommendations for Victoria's Marine, Coastal and Estuarine Areas

## **A Review of the Recommendations in the Environment Conservation Council's Marine, Coastal and Estuarine Investigation Final Report**

Prepared for the  
Environment Conservation Council

By  
Essential Economics Pty Ltd

**September 2009**



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## EXECUTIVE SUMMARY

### *Background*

This report provides an assessment of potential social and economic impacts which may arise from implementation of recommendations arising from the ECC's *Marine, Coastal and Estuarine Investigation Final Report*. This report draws on existing data to assess the likely implications of the ECC's recommendations for marine national parks, marine sanctuaries and aquaculture zones, and identifies the potential net costs and benefits for the State and for the coastal communities located in proximity to the nominated areas.

Whilst this assessment was primarily based on a review of existing data, contact was also made with commercial fishing industry representatives, individual fish processing operators, and government agencies including Fisheries Victoria and Tourism Victoria.

In terms of commercial fishing a major limitation in measuring the potential effects of the ECC recommendations is that there is no complete or consistent data base for the fishing industry, from numbers of boats and processing plants in particular locations, to employment levels and seasonality factors. This is an area where information on an industry-wide basis is a necessity if potential impacts are to be effectively measured.

We note that in some cases there are differences between the Marine and Freshwater Resources Institute (MAFRI) catch data from recommended marine protected areas and industry estimates of catch. However the MAFRI catch data are derived from official fisheries catch and effort data supplied by fishers themselves as a legal requirement. In the absence of a consolidated industry database on the value of commercial fishing, our position for this present study is to adopt MAFRI figures as per the ECC Final Report.

### *Potential impacts arising from ECC recommendations*

It is important to note that the socio-economic impacts likely to flow from implementation of the ECC recommendations are generally not measurable in specific quantifiable terms. This report identifies that the socio-economic impacts arising from implementation of the ECC recommendations will be experienced in two ways:

- in terms of activity levels (for commercial and recreational fishing, aquaculture, tourism, and park and resources management); and
- in terms of geographic area, depending on the strength of impacts on activities.

In terms of activities, impacts arising from the ECC recommendations may be experienced in:

- commercial fishing and related processing activities
- recreational fishing activities
- tourism growth potential
- marine aquaculture operations
- park management and management of marine resources.

These potential impacts are summarised below.

#### **1. *Commercial fishing and related processing activities***

Adverse impacts on commercial fishers are potentially significant in some cases. There may or may not be job losses in fishing, depending on whether or not the catch can be secured from other areas. In the unlikely event that none of the lost catch is sourced from other areas, the possible loss of employment for fishers could involve up to 39 jobs but in reality we do not believe this would be the case. This potential for some 39 lost jobs in fishing is equivalent to just 0.3% of all employment in the towns that are located near to the proposed marine parks and sanctuaries. It is expected that individual incomes will be reduced (unless other areas are fished), rather than whole jobs lost. The towns providing fishers to these areas would be expected to experience these reduced incomes.

## 2. *Marine aquaculture*

Drawing on experiences of aquaculture development in Tasmania, the likely employment generation for the State if the 12 areas nominated as aquaculture zones are operated by commercial interests could be as high as 1 200 jobs, but this is only a broad estimate and should only be used as an upper limit. This is an area for further research and analysis.

Of the regional coastal communities assessed, Portland is likely to be a primary beneficiary, with some level of commercial interest in the recommended site already evident.

## 3. *Recreational fishing*

The introduction of restrictions on recreational fishing in the selected coastal areas is unlikely to have any significant adverse effect on recreational fishing expenditures in the State. For local towns, there may be some isolated impacts where visits may decline and therefore associated spending levels would be reduced. However, these would be limited as accessible alternative fishing areas are available in proximity to areas designated for protection.

## 4. *Tourism*

The primary benefit likely to flow from the ECC recommendations in a tourism context is the opportunity for increased tourism marketing for the new marine national parks and sanctuaries. Generally, there would be no negative impacts arising from the ECC's recommendations as they may affect the tourism market. Tourism numbers would be unlikely to increase in any significant way in the short term as a direct result of the designation of marine national parks or sanctuaries. As a result, additional costs in the provision of new or expanded infrastructure to meet visitor needs would not be anticipated.

Increased marketing activity and product development generated through the creation of the national parks and sanctuaries may, in the long term, create additional jobs and income for the surrounding communities. Thus over time the marketing of the sites as part of the destination image of the towns and regions within proximity to the parks and sanctuaries, may lead to increased overall visitor demand.

## 5. *Implementation and management*

Employment generation is likely to occur with jobs created in the management of the marine protected areas, and in other aspects associated with the implementation of the ECC recommendations (such as in park patrols, enforcement, etc). However, numbers of such jobs are not yet available.

## 6. *Impact on towns*

Adverse impacts on towns would be experienced if processing plants and/or fishing co-operatives have to close due to reduced levels of product. Although it is unlikely that such closures would occur, this study suggests that of all the coastal towns Mallacoota, Portland and Apollo Bay would be most vulnerable to any such impacts. These impacts could be reflected in a reduction in existing employment levels, with multiplier effects feeding through the community. However the outcome is more likely to be a reduction in individual incomes of fishers, rather than a loss in jobs.

Moreover, any adverse effects on commercial fishing are unlikely to have a lasting adverse effect on the coastal towns, because most towns do not have a strong reliance on commercial fishing or recreational fishing and are generally reliant on a wider servicing role for local and surrounding resident populations and for tourists.

Overall, while the potential loss of commercial fishing activities in a town is important for the individual fishers, the net effect on a town's economy is not expected to be significant, with probably the only exception being Mallacoota where the fishing industry (in both harvesting and processing) is the main economic activity after tourism. Mallacoota is also a town that is distant from large centres or other generators of visitor trips (unlike, say, Torquay, Anglesea, Apollo Bay), and is therefore relatively more dependent on the fishing industry than other towns.

In our view, any net tourism benefits arising from the ECC recommendations are, in the short term, likely to be negligible in terms of generating new jobs and incomes. It is also likely that any loss in jobs associated with fishing and processing would be more than countered by potential growth in jobs in aquaculture, as well as in the management and implementation of the ECC recommendations.

## **7. *Social impacts***

The principal negative social impact is expected to be the potential loss of fishing jobs. Another important social impact is that which falls on fishing communities – these communities have generally survived many generations in difficult but challenging conditions. The potential loss of work is therefore a new and threatening change for those involved and for their close-knit communities.

The structural change that is evident in many of Victoria's regional communities is driven by the on-going shift from resource to service economies. For some coastal communities (usually those that are more distant from major population centres) the net result has been population decline which, in turn, has led to a reduction in demand for services such as banks, schools and the like. Flowing from such structural shifts are community perceptions of loss and isolation. Additional change through policy implementation could further entrench the negative community sentiment which may be evident in some towns.

## **8. *Environmental benefits***

The ECC recommendations recognise what is described as the “existence value” of Victoria's coastal and marine environment, and the recommendations provide the necessary framework within which to ensure conservation and preservation of the State's unique asset.

Environmental benefits flow from the preservation of the State's coastal and marine biodiversity. Increased scientific understanding, access to education opportunities and preservation of the State's unique assets for future generations, are some of the benefits generated through the protection of Victoria's marine environment. These benefits also have an economic aspect, although the economic value of such benefits is (very largely) unmeasured in Victoria at this time.



## INTRODUCTION

This report has been prepared for the Environment Conservation Council (ECC) by Essential Economics Pty Ltd. The report provides an assessment of the potential social and economic impacts which may arise from implementation of the ECC's *Marine Coastal and Estuarine Investigation Final Report* (2000).

This report draws on previous studies commissioned by the ECC and the former Land Conservation Council (LCC), and provides updated socio-economic profiles for a number of coastal communities identified as potentially affected by the ECC's recommendations.

The coastal communities are:

- Apollo Bay
- Cann River
- Foster, Port Franklin, Port Welshpool, Toora
- Lakes Entrance
- Mallacoota
- Port Campbell
- Portland
- Rhyll
- Seaspray
- Torquay / Anglesea

Our report is structured as follows:

- Method adopted for the review of the ECC recommendations
- Summary of the ECC recommendations
- Summary of likely socio-economic impacts arising from the ECC recommendations
- Potential impacts on commercial fishing
- Potential impacts on recreational fishing
- Potential impacts on tourism
- Aquaculture
- Management and implementation
- Potential impacts on coastal towns
- Conclusions

A summary of the telephone interviews conducted with commercial fishing operators and industry representatives are appended as Attachment A. Detailed socio-economic profiles are provided in a separate report (available in the ECC library) for the nominated towns.

## 1. APPROACH

Our assessment of potential economic and social impacts on coastal communities is based on the following approach:

- a review of the ECC Recommendations in the Marine Coastal and Estuarine Investigation Final Report (2000);
- a review of demographic and economic trends in the selected townships since 1991; and
- an analysis of likely socio-economic impacts of the ECC recommendations in regard to coastal communities.

The report draws on a number of sources to compile a demographic/socio-economic profile and an industry profile of the selected towns. This includes data from the Australian Bureau of Statistics (ABS) Population Census 1996, the ABS Business Register, Tourism Victoria, Fisheries Victoria, and other sources. Interviews have also been conducted with a number of fishing industry spokespeople in Mallacoota, Portland and Apollo Bay, and with peak bodies.

The socio-economic profile of the selected towns provides an understanding of:

- population shifts occurring in the towns,
- age structure,
- labour force participation, and
- key industries.

Our report provides an overview of the changes identified in the nominated townships, all of which are located in proximity to the areas proposed as marine protected areas. The report discusses the implications for commercial fishing, recreational fishing and tourism activity, and provides an assessment of the extent to which these impacts are likely to flow to the coastal towns and communities.

The extent and quality of available data limit the overall assessment, particularly as the brief for this study places emphasis on a review of existing material.

## 2. OVERVIEW OF ECC RECOMMENDATIONS

### 2.1 Introduction

The ECC report recommends marine areas to be reserved for the special protection of environmental values. The ECC proposes the following:

- 13 marine national parks
- 11 marine sanctuaries
- 18 special management areas

The marine national parks and the smaller marine sanctuaries will form the basis of the highly protected system. These areas, as recommended, represent approximately 63 136 ha or 6.2% of the total Victorian marine area of 1 017 400 ha.

Special management areas apply to areas where a lower level of protection is sufficient to protect special features. Five existing multiple-use parks will retain their current management arrangements.

The ECC also identifies 12 areas to be set aside for aquaculture. These areas are recommended where the negative effects on the environment are negligible or are within acceptable limits, and where the potential for conflict with other uses is minimal.

A summary of the ECC's proposed system of marine protected areas is detailed in Table 2.1 below.

**Table 2.1 Overview of recommended marine protected areas**

Proposed areas	Size of area (ha)	Number of areas	Summary of restricted activities
Marine national park	62 245	13	<ul style="list-style-type: none"> <li>• No recreational fishing or harvesting</li> <li>• No commercial fishing or marine aquaculture</li> <li>• No minerals or petroleum extraction or exploration</li> </ul>
Marine sanctuary	891	11	<ul style="list-style-type: none"> <li>• No recreational fishing or harvesting</li> <li>• No commercial fishing or marine aquaculture</li> <li>• No minerals or petroleum extraction or exploration</li> </ul>
Special management area	6 940	18	<ul style="list-style-type: none"> <li>• No marine aquaculture</li> <li>• No minerals or petroleum extraction or exploration</li> <li>• Specific management prescriptions may apply to some fishing activities</li> </ul>
<b>Total marine protected area</b>	<b>70 076</b>	<b>42</b>	

Source: Environment Conservation Council 2000.

## 2.2 Marine national parks

Areas recommended as marine national parks are provided high protection on the basis of their contribution to a system representing the range of marine environments in Victoria. No fishing, extractive or damaging activities are allowed in these areas. However, there is no restriction on access, and activities such as recreation, tourism, education and research are encouraged under appropriate conditions.

Given the restriction on fishing activity, the ECC identifies the potential impacts for users, particularly commercial and recreational fishers.

Table 2.2 below provides an overview of the areas recommended for marine national park status, and the user implications identified by the ECC in its Final Report.

**Table 2.2 Marine national park recommendations**

Recommendation No.	Name	Area (ha)	Nearest locality	ECC identified implications for users	
				<i>Recreation and tourism</i>	<i>Commercial fishing (rounded)</i>
<b>A1</b>	Discovery Bay Marine National Park	4 600	Portland	Relatively minor impact: level of use is low. Other accessible areas.	Estimated impact @ \$943 600
<b>A2</b>	Twelve Apostles Marine National Park	11 700	Port Campbell	Popular for passive recreation. Few locations popular for recreational fishing. Alternative fishing locations available.	Estimated value @ \$1 215 100
<b>A3</b>	Point Addis Marine National Park	4 750	Torquay / Anglesea	Much of park not readily accessible for recreational fishing, and alternative areas exist within reasonable distance.	Estimated value @ \$162 400
<b>A4</b>	Port Phillip Heads Marine National Park	3 340	Queenscliff/Portsea	Popular for passive recreational activities. Impact on recreational fishing identified as acceptable given proximity to alternative areas.	Estimated value @ \$1 151 000
<b>A5</b>	Yaringa Marine National Park	930	Tooradin	Little fishing identified in the park.	Limited amount of commercial fishing in the proposed park
<b>A6</b>	French Island Marine National Park	2 700	Tooradin	Popular for boat-based recreational fishing. Impact will be limited as alternatives available.	Estimated value @ \$85 000
<b>A7</b>	Churchill Island Marine National Park	675	Rhyll	Popular for boat-based recreational fishing; Rhyll is not included in the park, therefore reduced impacts on users.	Estimated value @ \$11 000
<b>A8</b>	Bunurong Marine National Park	2 150	Inverloch	Popular for passive recreational activities. Extension of existing park, all fishing is currently prohibited to 1km offshore.	Estimated value @ \$34 100
<b>A9</b>	Wilson's Promontory Marine National Park	16 600	n/a	Limited impact due to current restrictions on recreational fishing, the remoteness of the area and availability of other areas.	Estimated value @\$960 900
<b>A10</b>	Corner Inlet Marine National Park	4 150	Foster/Port Franklin/Toora/Port Welshpool	Popular for boat-based recreational fishing. Alternatives available.	Estimated value @ \$100 000
<b>A11</b>	Ninety Mile Beach Marine National Park	2 750	Seaspray	Ready access to much of coast should minimise impact on recreational fishing	Limited amount of commercial fishing in the proposed park
<b>A12</b>	Point Hicks Marine National Park	4 050	Cann River	Potential increase in visitation. Most popular fishing area (east side of Point) not included in proposed Park.	Estimated value @ \$637 000
<b>A13</b>	Cape Howe Marine National Park	3 850	Mallacoota	Effects on recreational fishing minimised by exclusion of sheltered waters around Gabo Island.	Estimated value @ \$766 200

Source: Environment Conservation Council 2000.



## 2.3 Marine sanctuaries

Marine sanctuaries are small, highly protected areas designated for protection on the basis of special features including habitat, special scientific significance, and the provision of recreational and education opportunities.

Areas recommended for sanctuary protection are designed to complement the recommended marine national parks, and contribute to the provision of a comprehensive, adequate and representative system of marine protected areas. The purpose of the zones is to conserve and protect the biodiversity and natural processes of the sanctuary. In these areas no fishing, extractive or damaging activity is allowed. Opportunities are identified for passive recreation, including underwater interpretative trails.

In the ECC investigation, implications for users are in the main, not addressed to the level of detail as provided for in the marine national park recommendations and this is due to the relatively small area designated for marine sanctuaries, as indicated in Table 2.3 below.

**Table 2.3 Marine sanctuary recommendations**

Recommendation No.	Name	Area (ha)	Nearest town/suburb
B1	Merri Marine Sanctuary	25	Warrnambool
B2	The Arches Marine Sanctuary	45	Port Campbell
B3	Marengo Reefs Marine Sanctuary	18	Apollo Bay
B4	Eagle Rock Marine Sanctuary	25	Aireys Inlet
B5	Point Danger Marine Sanctuary	20	Torquay
B6	Barwon Bluff Marine Sanctuary	18	Barwon Heads
B7	Point Cook Marine Sanctuary	290	Werribee
B8	Jawbone Marine Sanctuary	30	Williamstown
B9	Ricketts Point Marine Sanctuary	120	Beaumaris
B10	Mushroom Reef Marine Sanctuary	80	Flinders
B11	Beware Reef Marine Sanctuary	220	Orbost/Marlo

Source: Environment Conservation Council 2000.

## 2.4 Special management areas

Special management areas are small areas that are designated – either formally through legislation or through management arrangements – for protection of their special natural values. In these areas fishing and other uses are generally allowed. Unless otherwise stated, commercial and recreational fishing are not restricted, while encouragement is given to activities such as passive recreation, education and scientific study, which minimally affect the area and the particular values requiring protection.

Given the allowance of commercial and recreational fishing in these zones, the economic impact of these recommended areas is likely to be minimal.

## 2.5 Aquaculture zones

The development of a strong and healthy aquaculture industry in Victoria is supported by the ECC. Suitable areas are identified for farming of marine species, with the final recommendations focusing on achieving a balance between providing access to aquaculture and minimising the impact on environmental values.

Aquaculture zones are recommended on the basis of demonstrated successful performance or growth of target species in the past or through advice from Fisheries Victoria. Zones are chosen where conflict with other users will generally be minimal.

Potentially, the development of marine farming offers economic and social benefits in the form of new industry activity, with opportunity for employment generation.

## 3. POTENTIAL IMPACTS

### 3.1 Change in coastal towns

It is important to be aware of underlying changes which influence the profile of coastal townships, as this provides the background upon which to assess implications potentially arising from the ECC recommendations for marine, coastal and estuarine areas.

Many of Victoria's coastal towns are small both in area and in population, with key economic activities closely linked to the marine-based assets as well as the servicing of local residents and visitors to the area.

The coastline provides many opportunities for commercial fishing, recreational fishing, diving and numerous other recreational pursuits and general tourist activity. While these features are important to the underlying structure of the coastal townships, the global shift from primary industry to service economies has influenced the profile of many of these towns.

As a result, there may be structural change in particular sectors of a small town's economy (such as a reduction or a shift in farming activity in the surrounding area). However losses resulting from such structural change are often remedied by the growth in 'new' areas such as tourism and retirement living.

In regional Victoria, the on-going shift from resource based to service economies is evident. But for some coastal communities (usually those that are more distant from major population centres) the net result has been population decline which, in turn, has led to a reduction in demand for services such as banks, schools and the like.

For coastal towns and Victoria, the socio-economic impacts arising from implementation of the ECC recommendations will be experienced in two ways:

- (i) in terms of activity levels (commercial and recreational fishing, aquaculture and tourism); and
- (ii) in terms of geographic area, depending on the strength of impacts on activities listed above.

The nature of these impacts is described below, with details provided in subsequent sections.

### 3.2 Impacts on activity levels

Impacts arising from the ECC recommendations may potentially be experienced in:

- **commercial fishing and related processing activities**, with potential reductions in the volume and value of the catch, and potentially in employment levels if fishers and processors have to reduce their level of activities – alternatively, catch volume may be maintained by sourcing the catch from other areas not affected by the recommendations;

- **recreational fishing activities**, with potential loss of visitors at popular fishing spots that are now to be protected, and loss of their spending that would otherwise be directed to nearby towns (for accommodation, supplies, etc);
- **tourism growth potential**, where marine national parks and sanctuaries can be marketed as tourist attractions and destinations;
- **marine aquaculture**, where new or increased operations may generate economic activity;
- **management**, with potential new jobs associated with park management and infrastructure.

There are both direct and indirect impacts.

**Direct impacts** are the initial impacts that are (in this case) experienced by the fishers and processors who may have a reduced level of output due to implementation of the marine protection areas where fishing is not permitted. This reduced level of output (or catch) may mean a loss in employment and income for some or many of the fishers involved, and for the processors who depend on the catch to keep their processing plants in operation. Alternatively, direct impacts may be felt through employment created by marine aquaculture development and the resourcing of park management.

**Indirect impacts** are generated as the first round of effects (as measured by reduced fisher and processor income or employment levels) work their way through the local and wider economy. Multipliers are identified for industries by using Input-Output measures, and this is done in reference to Input-Output tables (usually at the national level), such as those prepared by the ABS (Australian National Accounts Input-Output Tables Catalogue No. 5209.0 1993–94). For the fishing industry, we allow for a multiplier of 3 (based on ABS Output Multipliers for 1993–94 and noting that detailed studies suggest some variation around this figure). A multiplier of 3 indicates that for every 1 job lost/gained in the fishing industry (ie, a direct job) there is a further loss/gain of 2 jobs (and these are the indirect jobs). In terms of positive indirect impacts, in the case of the aquaculture industry where potential employment could be generated, the multiplier is estimated at 3.5 (Fisheries Victoria – personal communication) and thus for every direct job created 2.5 indirect jobs are generated. As a matter of interest, the employment multiplier for the fishing industry (around 3) is significantly higher than for retailing (around 1.5) and most other labour-intensive service industries and including those which feature in the tourism sector.

In summary, the reason we need to be aware of these multiplier effects is that the potential loss or gain of jobs leads to a further loss or gain of jobs in other sectors (eg, in packaging, transport, export administration, etc) as the economic effects work their way through the economy. The overall outcome in economic terms (a loss/gain in jobs and incomes) can therefore be more significant for a town than the initial loss/gain of a number of jobs.

Subsequent sections of this report describe the likely impacts of the ECC recommendations on commercial fishing, recreational fishing and tourism.

### 3.3 Impacts on geographic areas

The geographic impact of the ECC recommendations will be influenced by the extent of impact on particular activities (as noted above). The impacts are most likely to be felt in localities where there is a high level of reliance on the fishing industry in terms of both harvesting and processing.

Clearly, any social and economic impacts are most likely to be experienced in the coastal towns where there is reliance on the fishing industry, including fishers and/or processing operations.

Importantly, the extent of these impacts on a particular town will be affected by the degree to which the town also has other employment and income generating activities. For example, over the years many coastal towns have developed new roles in tourism, or as popular places for people to retire to, or as places from which residents can commute to work in larger, nearby centres. For some towns, tourism activity is linked to recreational fishing; however, for the majority of towns examined in this analysis tourism growth is associated with passive recreational pursuits such as sightseeing, walking and water-based pursuits apart from fishing. In these circumstances, any reduction in activities associated with the fishing industry may not be as negative for the town as would otherwise be the case. These factors are taken into account in this assessment of potential social and economic impacts arising from the ECC recommendations.

### **3.4 Environmental benefits**

The ECC recommendations recognise what is termed the “existence value” of the Victoria’s coastal and marine environment, and the recommendations provide the necessary framework within which to ensure conservation and preservation of the State’s unique asset.

Globally, the supply of wild fisheries is levelling or declining, and careful management of the resource is required if future generations are to enjoy the benefits of a healthy and diverse marine environment. Sustainable resource management is a goal for most modern economies and the ECC recommendations, enabling the preservation of a share of the State’s coastal and marine environment, are an important component in the management of Victoria’s sensitive marine environment.

Environmental benefits flow from the preservation of the State’s coastal and marine biodiversity. Increased scientific understanding, public appreciation, education opportunities and preservation for future generation’s enjoyment, are some of the benefits generated through the protection of Victoria’s marine environment. In addition protection of some fish stocks in parks provides a form of insurance against unforeseen events in fished areas.

### **3.5 Limitations in the analysis**

It is important to note that the socio-economic impacts likely to flow from implementation of the ECC recommendations are generally not measurable in specific quantifiable terms. This is due principally to the lack of data on the numbers of jobs likely to be affected in fishing and processing. We note that the fishing and seafood industries do not have figures on aggregate employment in these harvesting and processing/packaging industries.

Notwithstanding these data limitations, this report provides guidance on the socio-economic impacts, which potentially may arise as a result of implementation of the ECC recommendations.

## **4. COMMERCIAL FISHING**

### **4.1 Introduction**

This section provides an assessment of the commercial fishing catch for each of the areas where the ECC has recommended a ‘marine protected area’ (ie marine national park or marine sanctuary), and provides estimates of the economic and social effects that may result on the nearby towns where there is a ‘no-take’ recommendation for the areas involved.

Information is provided on:

- the present Victorian annual catch for abalone, rock lobster and (where available) for other fish;
- estimates of catch and impact from areas affected by ECC recommendations, based on the Marine and Freshwater Resources Institute (MAFRI) and Fisheries Victoria catch and effort data (as detailed in Appendix 5 of the ECC Final Report); and
- indication of potential impacts on individual towns.

Based on examination of the MAFRI data and discussions with fishers and processors, the specific towns identified for impact assessment are Portland, Apollo Bay and Mallacoota. Comments are also provided on the likely impact situation in the other towns covered in this study.

## 4.2 Abalone and rock lobster – annual catch for Victoria

The principal effects of the ECC recommendations are expected to be experienced by those involved in fishing for abalone and for rock lobster. These two sectors of the commercial fishing industry accounted for a total of some \$64.3 million in 1997/8, as indicated in Table 4.1.

**Table 4.1 Abalone and rock lobster catch, quantity and value**

	Abalone	Rock lobster
Quantity 1997/98	1 440 tonnes	501 tonnes
Value 1997/98	\$48.8 million	\$15.7 million
Average \$/kg	\$33.93/kg (1999)	\$31.33/kg (1998/99)
*Average catch in kg 1990/1 to 1997/8	*1 400 tonnes pa	*478 tonnes pa

Source: MAFRI 1997/98

Note: \*Essential Economics – derived from Department of Natural Resources and Environment and MAFRI, *Catch and Effort 1998 Information Bulletin*

As the table shows, for the past decade the abalone catch has been averaging 1 400 tonnes per annum and this approximates the annual quota of 1 440 tonnes.

The annual abalone quota, according to zone, is:

- Western Zone (SA border to Warrnambool): 280 tonnes (19%)
- Central Zone (Warrnambool to Lakes Entrance): 700 tonnes (49%)
- Eastern Zone (Lakes Entrance to NSW border): 460 tonnes (32%).

The rock lobster catch is estimated at around 501 tonnes for 1997/98 and is drawn from two zones:

- Western Zone (ie west of Cape Otway): 436 tonnes harvested (87%)
- Eastern Zone (ie east of Cape Otway): 65 tonnes harvested (13%).

## 4.3 MAFRI estimates of catch and value from areas affected by the ECC recommendations

The ECC Final Report (Appendix 5) provides estimates of the catch potentially affected by the recommendations based on MAFRI estimates and Fisheries Victoria catch and effort data.

The following figures show the values which are potentially affected. Note that any variations in percentage impacts are due to rounding values of different magnitudes (eg dollar value, tonnage, percentage).

**Table 4.2 Estimate of the value of the catch affected by the ECC recommendations**

	Estimate of value of catch affected by recommendations	Estimate of total value of Victorian catch	% of total value of catch affected by recommendations
Abalone	\$5.4 million	\$48.8 million	11
Rock lobster	\$1.0 million	\$15.7 million	6.4
Other fishing	\$0.6 million	na	na
<b>TOTAL</b>	<b>\$7.0 million</b>	<b>na</b>	<b>na</b>

Source: MAFRI 1997/98

Note: These figures exclude all marine sanctuaries other than Point Cook and Beware Reef Marine Sanctuaries (these are significantly smaller areas than marine national parks). Dollars expressed in average 1999 prices (abalone) and average 1998/99 prices (rock lobster).

Taking the abalone and rock lobster figures and comparing these with the known abalone quota and rock lobster catch on a zonal basis, we are able to estimate the proportionate impact of the recommendations on total quota/catch for each zone. This is shown in Table 4.3.

**Table 4.3 Estimates of tonnage affected by the ECC recommendations as a proportion of the total abalone and rock lobster quota/catch**

Zone	Estimate of catch affected by recommendations (tonnes)	Catch (tonnes) (quota in the case of abalone)	Affected catch as % of total quota/catch
<b>Abalone</b>			
Western	14.2	280.0	5.1
Central	104.0	700.0	14.8
Eastern	40.7	460.0	8.8
<b>TOTAL</b>	<b>158.9</b>	<b>1 440.0</b>	
<b>Rock lobster</b>			
Western	27.3	436	6.4
Eastern	6.1	65	9.4
<b>TOTAL</b>	<b>33.4</b>	<b>501</b>	

Source: MAFRI 1997/98

Note: These figures exclude all marine sanctuaries other than Beware Reef Marine Sanctuary (these are significantly smaller areas than marine national parks).

Based on the above figures, we note that the **abalone** harvest in the affected areas (across all zones) amounts to 11% of the Victorian catch. This ranges from 5.1% in the Western Zone, to 14.8% in Central Zone, and 8.8% in the Eastern Zone.

For **rock lobster**, the overall impact is estimated at 6.7% of the Victorian catch on the above figures, with the catch in the Western Zone being 6.4%, and in the Eastern Zone 9.4%.

Within each of the broad zones, we also note that the percentage impact on abalone and rock lobster fishing in specific marine protected areas will be less than the averages indicated above for the (wider) zones in which the protected areas are located. These individual average impacts, as identified in the ECC report, are indicated in the following Table 4.4.

**Table 4.4 MAFRI estimates of the catch from individual marine national parks**

	<b>Location</b>	<b>Abalone catch</b>	<b>Rock lobster catch</b>	<b>Other fishing*</b>
A1	Discovery Bay Marine National Park	\$480 822 5.1% of Western Zone catch	\$452 812 3.4% of Western Zone catch	\$10 000
A2	Twelve Apostles Marine National Park	\$773 400 3.3% of Central Zone catch	\$402 684 3.0% of Western Zone catch	\$39 000
A3	Point Addis Marine National Park	\$55 577 0.2% of Central Zone catch	\$54 828 2.6% of Eastern Zone catch	\$52 000
A4	Port Phillip Heads Marine National Park	\$1 119 690 4.7% of Central Zone catch	\$31 330	Negligible
A5	Yaringa Marine National Park	Nil	Nil	Negligible
A6	French Island Marine National Park	Nil	Nil	\$85 000
A7	Churchill Island Marine National Park	Nil	Nil	\$11 000
A8	Bunurong Marine National Park	Nil	\$28 072 1.3% of Eastern Zone catch	\$6 000
A9	Wilson's Promontory Marine National Park	\$791 214 3.3% of Central Zone catch	\$31 706 1.6% of Eastern Zone catch	\$138 000
A10	Corner Inlet Marine National Park	Nil	Nil	\$100 000
A11	Ninety Mile Beach Marine National Park	Nil	Negligible	Low
A12	Point Hicks Marine National Park	\$567 157 3.6% of Eastern Zone catch	\$27 884 1.3% of Eastern Zone catch	\$42 000
B11	Beware Reef Marine Sanctuary	\$145 899 0.9% of Eastern Zone catch	\$15 665 0.7% of Eastern Zone catch	Negligible
A13	Cape Howe Marine National Park	\$667 335 4.3% of Eastern Zone catch	\$1 911 0.1% of Eastern Zone catch	\$97 000

Source: Environment Conservation Council 2000 (Appendix 5). \* Other fishing estimates are rounded.

#### 4.4 Industry estimates for abalone and rock lobster catch

In discussions with representatives of the peak industry organisation, Seafood Industry Victoria, operators of fish processing plants and industry co-operatives, it is evident that there is variance between industry estimates of the catch potentially affected by the ECC recommendations for marine protected areas, and MAFRI estimates provided in the ECC Final Report.

There are a number of reasons for the disparities in MAFRI data and industry estimates. A large part of this can be explained by the use of different sources of information and the survey methods adopted, the difficulties in tracking fish catch (given the *cells* approach), and a lack of coordination or reconciliation in data from official sources and from individual fishing co-operatives.

Appendix 5 of the ECC Final Report provides a detailed discussion of the MAFRI catch and effort data and the potential sources of variance between industry and official data. Our position for this present study is to adopt the MAFRI figures as the basis for the assessment.

#### 4.5 Potential impacts of commercial fishing on individual towns

It is difficult to precisely identify impacts of the ECC recommendations on specific coastal towns for a number of reasons.

- **Catch data.** There is variation between MAFRI data and industry sources in the estimates of catch from the recommended marine protected areas. If the MAFRI figures are under-estimates, as claimed by the industry, then potential adverse impacts on the fishing industry and the towns will be greater than otherwise estimated.

- **No industry data base.** A major limitation in measuring potential effects of the recommendations is that there is no complete or consistent data base for the fishing industry, from numbers of boats and processing plants in particular locations, to employment levels and seasonality factors, etc. This is an area where information on an industry-wide basis is a necessity if potential impacts are to be measured with any accuracy. Such a database would also benefit the fish harvesting/processing industry and local/State government in planning for and promoting the industry and encouraging local development.
- **Alternative sources of supply.** Where a fisher or processing plant is affected by a marine protected area, then the fisher may be able to fish in other areas and the processing plant may be able to source suppliers fishing in other areas or inter-state. In other words, in these circumstances there would be no net adverse effect on fishing or processing activities.
- **Adverse impacts may be overcome / ameliorated.** While there can be adverse effects on a town through, say, loss of fishers, a positive outcome may be that the individuals involved find employment in other sectors in the town and therefore there is no net effect on employment levels. However, this may be difficult for the individuals to achieve as transition to other employment is not necessarily easy, especially where unemployment levels are already high (around 11% in East Gippsland, or about twice the State average).

Having regard for these variables, the following comments are provided for towns where commercial fishing activities may be affected by the ECC recommendations.

#### 4.6 Potential impacts associated with commercial fishing

This overview of commercial fishing activity and its relationship to coastal towns – as they may be affected by the ECC recommendations for marine protected areas – indicates three broad levels of possible impact.

**Adverse impacts on commercial fishers could be significant** in some cases in that:

- fishers will have to fish in other areas (with additional travel and operating costs to the fisher in accessing these alternative areas) and, in turn ...
- this will place greater pressure on these other areas and on the existing fishing operations in these other areas, while ...
- some existing fishing enterprises may have to close (at personal cost unless bought out by a funded scheme), while others ...
- will possibly become involved in illegal fishing activity by continuing to fish in areas now protected from fishing (and this option has been highlighted by industry observers as a very unfortunate but likely outcome for some).

In terms of the potential impact on jobs, there are two scenarios that are relevant, and these can be summarised as follows:

- on the one hand, there may be no net effect on the fishing industry if the 'loss' in catch from the protected areas is made up by catch sourced from other areas;
- on the other hand, there could be a net adverse effect on some fishers if this 'loss' is not made up from stock harvested from other areas, and they may have to contend with lower average catch (or a lower quota in the case of abalone), and this would also place a financial burden on some or many fishers working in the affected areas – some may have to leave the industry. There is no industry-wide indication of these numbers.

The final outcome, according to people contacted in this study, is that both scenarios will be relevant – other areas will be fished (with no loss of jobs), while some fishers could suffer financial loss as in the case of abalone fishers if they have reduced quotas.

In these circumstances, it is very difficult to forecast what is most likely to occur, and it is virtually impossible to measure potential job loss, especially where the “loss” may be financial and therefore absorbed by some fishers, while others may choose to leave the industry.

Of course, the compounding difficulty is that the fishing industry has no official estimates of numbers of persons employed in the industry, and this represents a huge gap in industry data (especially at a time when the industry is endeavouring to deal with restructuring, job loss, and other structural changes).

MAFRI figures provided in the ECC report (and noted above in Table 4.2) indicate the value of the catch in the recommended protected areas is \$5.4 million in abalone fishing (equivalent to about 11% of total abalone catch); \$1.0 million (or 6.8%) in rock lobster catch; and \$0.6 million in other fishing (percentage share not applicable, see Table 4.5). The figure for other fishing does however represent 5% of the value of fish (excluding abalone and rock lobster) landed in Victorian ports.

One way of obtaining at least an indication of potential job loss in the fishing industry is to translate these impacts on turnover into impacts on equivalent full-time employment, but there are serious reservations attached to this approach. Table 4.5 shows our estimates of employment, based on licence data provided by Fisheries Victoria and estimates from Seafood Industry Victoria on the average numbers of employed persons per licence.

**Table 4.5 Estimates of employment in fishing, 2000**

Type of licence	No. of licences	Estimate of employed persons (rounded)
Abalone	71	140 (allow 2 jobs per licence)
*Rock lobster	126	315 (allow 2.5 jobs per licence)
**Other fishing	**839	**1 680 (allow 2 jobs per licence)
<b>Total</b>	<b>1 036</b>	<b>2 135</b>

Source: Fisheries Victoria (number of renewed commercial fishing licence holders as at 12 July 2000 excluding inland licence holders); Seafood Industry Victoria (broad estimates on average jobs per licence holder).

\* Excludes 28 inactive licences and 4 licences reporting less than 100kg as noted in Rock Lobster and Giant Crab Quota Panel Allocation – Report on Allocation of Individual Quotas for the Southern Rock Lobster and Giant Crab Fisheries in Victoria – October 1999.

\*\* With other fishing there are considerable difficulties in estimating catches and jobs due to a number of factors:

- (i) there are many individuals with multiple licences
- (ii) landed catches are from a mix of State and Commonwealth managed fisheries
- (iii) many of the jobs are part time.

The table shows an estimated total of 2 135 jobs in coastal fishing at the present time, including 140 jobs in abalone diving, 315 in rock lobster fishing, and 1 680 jobs in other fishing.

By applying the percentage estimate of catch, as estimated by MAFRI, we are able to estimate in very broad terms the potential loss in equivalent full-time jobs in the fishing industry – however, we do not believe this is a likely outcome at all, for reasons noted below. The potential ‘lost’ jobs are shown in Table 4.6.

**Table 4.6 Estimate of potential impact on jobs of the ECC recommendations**

Type	Estimated total jobs	Estimated catch in protected areas	Estimated loss of jobs (full-time equivalent)
Abalone	140	\$5.4 m or -11%	15
Rock lobster	315	\$1.0 m or -6.8%	21
Other coastal fishing	1 480	\$0.6 m (% na)	3
<b>Total</b>	<b>2 135</b>	<b>\$7.0 m</b>	<b>39</b>

Source: See Table 4.5.

Note: Indicative impacts only. ‘Other fishing’ job loss is based on the ECC’s estimated 8.5% share of total catch.

While the figures in the above table suggest that up to 39 fishing jobs could be lost under this ‘worst case’ scenario, this is most unlikely to happen. The simple reason is that a reduction in area that is estimated to yield 11% impact on abalone catch and a 6.8% impact on rock lobster – when applied on an individual basis to licensed fishing operations – means that a fraction of an existing job would be lost, rather than a whole job. What this means in reality is that the income or hours worked is reduced for the particular job/position that is being ‘cut’ or reduced due to the loss in catch.

This exercise demonstrates that the most likely outcome of any ‘loss’ in catch would be a reduction in income due to reduced quota or catch. In some cases, the fisher will move to another area and make up any loss from a marine protected area in that way (although this could place pressure on the area now moved to, as others are likely to already be fishing there). However, it is most unlikely that a 6% to 9% loss in catch would ever feed through to a 6% to 9% loss in jobs. This is also the consultant’s experience in many employment and economic impact assessments at the enterprise level, across many sectors.

Even if all job losses in fishing actually amounted to the 39 jobs noted above, this figure represents only 0.3% of all employment in the 10 or so coastal towns covered in this study. There could be losses in processing and related activities, but it is also possible that these operations would source their input from other areas and maintain operations.

We also need to keep in context that the individuals and firms and towns involved in any potential loss of fishing and related employment can take remedial action to self-correct potentially negative outcomes for the community. While some of those involved in operating processing plants have indicated that they would source their needs from further afield, rather than close their operations, other employment opportunities are expected to continue to grow as many small towns develop new roles (as described in this report). In this way, some of the indirect impact is avoided.

***Adverse impacts on towns will be experienced where processing plant and/or fishing co-operatives may have to close*** due to reduced levels of product. This study suggests the adverse impacts would be mainly felt in Mallacoota, Portland and Apollo Bay, with fishing co-operatives and fish processing plants located in each of the towns. The impact of the ECC recommendations on the viability of co-operatives and firms in Mallacoota, Portland and Apollo Bay is difficult to estimate. Impacts could be reflected in a reduction in existing employment levels, with multiplier effects feeding through the community as other suppliers and service providers react to lower levels of activity in the fishing and processing activities. Alternatively, reduced catch levels and therefore reduced revenues/incomes, could possibly be absorbed by the industry without actual loss of jobs (as described earlier in section 4.6).

Many towns have experienced this pattern over the years in response to structural change in local economies and local industries. However, note the comments following in paragraph (4) in respect to town-wide effects.

***Generally, the adverse effect on commercial fishing is unlikely to have a lasting adverse effect on the coastal towns*** since in the main these towns do not have a strong reliance on commercial fishing (or recreational fishing – see section 5), and are generally reliant on a wider servicing role for local and surrounding resident populations and for tourists. While the potential loss of commercial fishing activities in a town is critically important for the individual fishers, the net effect on a town’s economy is not expected to be significant, with probably the only exception being Mallacoota where the fishing industry (in both harvesting and processing) is the main economic activity after tourism. The impacts on Mallacoota will be dependent on whether there is a reduction in abalone catch, as a result of the implementation of the ECC recommendations.

We also note that in the ‘worst case’ scenario, the potential loss of some 39 lost jobs (see above) in fishing is equivalent to just 0.3% of all employment in the towns that are located near to the proposed marine parks and sanctuaries. This ‘worst case’ scenario impact is not a significant economic or employment impact in the overall context of the coastal towns.

In summary, the net effects for the fishing industry as a whole or for the towns involved are not likely to be significant.

However, a further consideration is that although job loss in fishing and processing may be low or even zero, the reality is that for some small coastal towns the loss of even just a few jobs may impact severely on the local economy. Many small towns across the State and at the national level have already encountered other policy impacts, such as industry restructuring and the regionalisation of services to larger centres. While it is difficult to place firm numbers against possible job losses in the nominated towns, it will be important to monitor the impacts of the implementation of the ECC recommendations on coastal towns.

One area where there is little doubt about the severity of impact associated with job loss is where such impact falls on individual fishers, especially where new employment is difficult to find, and where it is difficult to even supplement possibly reduced incomes from fishing.

## 4.7 Conclusions

The following conclusions have been reached regarding potential employment impacts in commercial fishing sector.

- It is not clear whether there would be any loss of direct jobs in fishing, since those affected by ‘no take’ areas may simply fish in other areas, thus avoiding any employment loss. Similarly, a processing plant may well be able to source its catch from other locations if some of its product is currently from no-take zones.
- In any event, the ‘worst case’ scenario the potential loss of 39 jobs represents only 0.3% of all employment in the coastal towns covered in this study, and this is not a significant impact.

The other factor to keep in mind is that there may well be no loss in fishing and processing jobs if the loss in catch from areas to be designated as ‘no take’ areas is made up from other fishing areas. It is not possible to provide firm estimates of employment potential, and this task is made more difficult by the absence of any comprehensive industry data.

## 5. RECREATIONAL FISHING

### 5.1 Economic contribution of recreational fishing

The recreational fishing industry is estimated to contribute approximately \$1.27 billion annually to the Victorian economy, supporting 27 000 jobs and contributing some \$83 million to household income. This finding is from a report to Fisheries Victoria prepared by NIEIR (authored by Bill Unkles), entitled *Economic Impact of Recreational Fishing in Victoria*, July 1997.

These estimates were based on field surveys of fishers. The data collected was geographically categorised by five regions in Victoria, three of which contain marine and estuarine environments (namely South East Region, South West Region and Melbourne Region). These three coastal areas accounted for approximately 80% of the contribution to the economy, with recreational fishing in the Melbourne region accounting for 60% of all expenditure while the other two regions contributed 20% of the total. The dominance of the Melbourne region reflects the relatively high density of population in this region and the tendency for capital expenditures to be made within the home region of respondents regardless of where they are fishing.

The NIEIR study also showed that within the coastal zones an estimated 50% to 54% of recreational fishing expenditure was related to marine and estuarine fishing. Thus, the total contribution of this type of recreation to the economy would be approximately \$600 million per annum.

### 5.2 Likely impact of the ECC recommendations on recreational fishing

The ECC Marine, Coastal and Estuarine Investigation identifies 13 areas for recommendation as marine national parks and 11 areas for marine sanctuaries. Within these areas recreational fishing and harvesting would no longer be permitted. The ECC has broadly reviewed the recreational use of the specific areas and concludes that in most cases the impact of the recommendations on recreational fishing would be minor.

There is little evidence to counter this conclusion. However, within certain locations there will be recreational fishers who are strongly opposed to the creation of 'no-take' areas, as they will have been fishing in these areas, often for many years with varied success. These fishers will be likely to strongly oppose their exclusion from these protected areas. However, whether this has a significant impact on their participation in recreational fishing is an unknown. It is likely high intensity recreational fishers, with significant investments in capital equipment, will continue in the pastime and will find other locations outside of the protected areas. Almost 94% of Victoria's marine area will still be available for recreational fishing.

It is possible that the catch of some recreational fishers may fall as they are excluded from their favourite sites. However, this does not directly impact on the contribution of recreational fishing to the economy. The economic contribution is measured on the basis of purchases of fishing supplies and equipment, and through expenditures related to fishing trips, such as accommodation, food and beverages, other entertainment etc. If fishers merely swap locations, the State-wide economic impact is unlikely to change.

For many people recreational fishing is just one component of a tourist trip rather than the prime purpose. Some 23% of respondents to the expenditure survey (NIEIR, 1997) indicated that fishing was not the prime reason for their current trip. Within the South East and South West regions 41% and 28% of respondents, respectively, cited reasons other than fishing as the prime reason for their trip. Thus, persons fishing as part of a trip for other reasons are unlikely to be significantly affected by the development of exclusion areas.

Within the South East and South West regions the total contribution to State Gross Regional Product from recreational fishing is currently some \$250 million. Allowing for marine fishing to account for around 54% of this expenditure (see section 5.1 above), the contribution of recreational marine fishers would be around \$135 million. If all persons whose prime reason for a trip was fishing were to give up the activity, the loss in spending would be approximately \$87 million. For the Melbourne region, the contribution of dedicated marine recreational fishers could be as large as \$584 million.

While some dedicated fishers may give up fishing due to the creation of highly protected areas, this is likely to have only a small impact, as the total size of the parks and sanctuaries is small and many of the locations are relatively inaccessible.

The impacts may be more keenly felt in local communities if recreational fishing is a major tourist attraction for the region. These areas include many of the coastal locations on the far South East coast such as Bemm River, areas in the Gippsland Lakes (these are not included in the ECC recommendations) and parts of the Croajingolong National Park. The proposed Point Hicks Marine National Park is adjacent to Croajingolong but is relatively remote and excludes the popular Tamboon Inlet area as well as Clinton Rocks and the easternmost section of Point Hicks itself. It appears the areas proposed for national parks and sanctuaries are not generally major destinations for large numbers of recreational fishers although important for some individuals, and in all cases they have significant alternative fishing areas available within close proximity.

Overall, the key factor in determining impacts on recreational fishing expenditure of the proposed national parks and sanctuaries is the likely reaction of affected fishers. This cannot be predicted by reference to previous studies. However, given the high level of capital expenditure by some fishers and the relative mobility of boat based fishers and remote area surf and rock fishers, it seems unlikely that the creation of limited highly protected areas would significantly reduce expenditures.

### 5.3 Specific locations

The **Discovery Bay Marine National Park** is the most westerly of the proposed reserves. Although this proposed marine national park is located just west of Portland, the economy of Portland has relatively little dependence upon the tourism industry as evidenced by the low share of employment in the accommodation, cafes and restaurant sector (4.6%) and the culture and recreation sector (1.8%). The access to the waters of the marine national park is relatively limited by land, and the potentially rough nature of the sea constrains recreational boating. The ECC recommendation for this locality is therefore unlikely to have any adverse effect on the local or regional economy.

The **Twelve Apostles Marine National Park** will have little impact on recreational fishers as access is difficult and, as noted by the ECC, several of the most popular fishing areas are not in the Park. In terms of recreational fishing, the restrictions may have a small impact on Port Campbell's economy but other aspects of tourism and the emerging gas industry are more important for this town.

The **Point Addis Marine National Park** includes the internationally-known Bells Beach and incorporates some popular surf and rock fishing areas. The impact of restricting fishing in this area is likely to be significant in terms of recreational fishers. However, the impact on the local economy is expected to be limited as other areas offer easier access for the recreational fisher (ie, they will still come to fish in this region), and the local towns have reasonably diverse economies that do not depend on the spending of recreational fishers.

The loss of recreational fishing in the **marine sanctuaries** of the west coast is unlikely to have significant local economic impacts since these reserves are relatively small and alternative fishing areas are easily accessible.

The extension of the existing **Point Cook** highly protected reserve from 300m to the larger marine sanctuary is likely to have only a marginal impact in restricting some boat fishers. There are many alternative recreational fishing locations.

The limitation on fishing in the **Jawbone Marine Sanctuary** is unlikely to have any significant impact, given the restrained land access. There is also limited boat-based fishing here and many alternative areas are available.

The proposed parks for **Western Port** may impact on recreational fishing activity but this should be limited due to the relative inaccessibility of **Yaringa** and **French Island Marine National Parks** and the non-inclusion of most popular fishing channels. These fishers are mainly boat based and they would be able to find other areas for their activity with ease.

The **Churchill Island Marine National Park** may constrain activity of some boat-based fishers, but the popular areas have been excluded, as have selected channels. Again, the impacts should be minor.

**Bunorong Marine National Park** is effectively the seaward extension of an existing sanctuary and therefore any impact on recreational fishing should be limited.

Similarly, the impacts of the **Wilson's Promontory Marine National Park** will be limited, although there will be some impact on recreational abalone divers.

The **Ninety Nile Beach Marine National Park** is only a small area along this beach and as a result it would not be expected to reduce opportunities for recreational fishers. The proposed park is relatively inaccessible by land.

It is unlikely the ECC recommendations will affect the quantum of recreational fishing within Port Phillip and the Westernport region as the protected areas are relatively small and in some cases quite inaccessible.

The **Point Hicks Marine National Park** and **Cape Howe Marine National Park** are unlikely to create real problems for recreational fishing activity. The Point Hicks park does not include the popular Bemm River, or Tamboon Inlet estuaries Clinton Rocks area or the easternmost section of Point Hicks itself, and in any case is relatively remote. The Cape Howe Marine National Park has been designed to avoid the major recreational fishing areas (and therefore should not affect recreational fishers attracted to Mallacoota), although some boat-based fishers may feel aggrieved by the restriction on fishing in the area to be reserved for the marine national park.

The impact on the eastern zone of the ECC recommendations will be minor given the small and relatively remote locations of the proposed protected areas. Generally there appear to be many alternative and viable fishing sites.

## 5.4 Summary

The introduction of restrictions on recreational fishing in the selected coastal areas is unlikely to have any significant adverse effect on recreational fishing expenditures in the State. For local towns, there may be some isolated impacts where fisher visits may decline and therefore their associated spending levels would be reduced. However, these impacts should be limited as accessible alternative fishing areas exist which are accessible. In many

cases, popular recreational fishing areas have been specifically left out of zones reserved for protection. In any event, most fishers are relatively mobile with cars and/or boats and will tend to find alternative fishing locations. The economic impact is therefore likely to be small. Moreover, most towns do not rely heavily on recreational fishing spending, and they will continue to attract holiday-makers who are attracted by a range of factors other than just fishing.

Notwithstanding the above, there are strong perceptions in the Victorian fishing community relating to loss of access to waters for recreational fishing. These perceptions are generally based on the belief that access to recreational fishing should be unrestricted, and opposition to change is considered to be high. However, like many 'rights issues', perceptions change over time and what was once perceived as an infringement of personal liberty eventually becomes the accepted norm. A point in case is the Bunurong Marine Park which was declared a sanctuary zone in 1991. The initial recommendation was met with strong local opposition prior to its declaration, but now appears to be well accepted by the community.

## **6 TOURISM ACTIVITY IN COASTAL TOWNS**

### **6.1 Introduction**

This section provides an overview of tourism trends, with special reference to coastal towns in Victoria. While fishing (both commercial and recreational) has for many generations been the life-blood of many coastal towns, today the economic base of these places is becoming more reliant upon tourism. Other components in the economic base of these towns are also becoming more important in attracting new residents and activity, such as attracting retirees and others seeking a 'seachange' in their lifestyle, or as commuter settlements for those working in metropolitan locations.

### **6.2 Tourism as an economic component for towns**

Tourism activity is an important component in the economic development of many coastal communities. This has previously been identified in a report to the (then) LCC by TBA Planners (1996), and is confirmed in more recent industry information.

Today, approximately one-in-three (34%) of non-metropolitan visits in Victoria are to regions with coastal aspects (Tourism Victoria 2000).

The Great Ocean Road, Lakes & Wilderness, and Phillip Island and Gippsland Discovery are the key non-metropolitan regions attracting a high share of domestic visitor activity. Much of this activity is in the form of passive recreation, with other key activities in these regions involving shopping, driving for pleasure and sightseeing. Approximately 8% of overnight visitors and 4% of day visitors to the Great Ocean Road reported fishing as an activity undertaken in the region. However, for the Lakes & Wilderness product region and the Phillip Island and Gippsland Discovery product region, fishing is reported as an activity by 23% and 13% of overnight visitors respectively (Tourism Victoria 2000).

Tourism activity in coastal centres tends to be seasonal, with high tourist flows typically occurring around special events and school holiday periods, and especially in the summer months. Accommodation varies in coastal centres, but the primary types typically include hotels, motels and caravan parks. Bed & Breakfast accommodation and boutique accommodation (such as upmarket fishing lodges or retreats located in wine regions) are emerging in some coastal areas.

A high share of coastal destinations attract the holiday visitor rather than those in the 'business' or 'visiting friends and relatives' markets. The opportunity to 'escape' is a part of the strong appeal of such destinations. Education and nature-based product development opportunities are also generally evident in small coastal communities. Water-based activities such as swimming, fishing and diving are also strong attractors for these areas. The strength of recreational fishing as an activity is shown in section 5 of this report.

Tourism activity is also a key driver for much of the retail activity that occurs in small towns. Likewise, the provision of services such as access to banking and to after-hours fuel and food, is often linked to the demands of

visitors rather than the needs of the small communities. Retail and service provision for many of the coastal communities is based on the size of the permanent population base as well as the volume and frequency of visitor flows.

For some coastal destinations, such as Mallacoota, access to recreational fishing is a key attractor. However, in most cases the special appeal of a coastal town reflects a number of factors, ranging from access to surrounding wilderness to historic attractions and ‘must-see’ icons, such as travel along the Great Ocean Road.

While recognising the popularity of fishing, Tourism Victoria acknowledges that the recreational fishing market is a difficult market to influence. Previous research undertaken on behalf of the Department of Natural Resources and Environment indicated that an estimated 800 000 Victorians participated in recreational fishing both inland and marine waters. However this figure is likely to be much lower with only 250 000 licences sold per annum since the introduction of regulated recreational fishing. The largest share of recreational fishers are day-trippers or anglers who include fishing in a trip away as a matter of course. When on extended trips, this market tends to camp out and, in expenditure terms, generally engages in low-yield activities.

In terms of destination marketing, the ‘high yield angler’ is Tourism Victoria’s target market. This market represents anglers who use tour guides, charter boats, stay in fishing lodges, and undertake extended fishing trips to interstate and international destinations.

Anglers who take planned fishing trips to regional Victoria and interstate destinations are also viewed as target markets for regional tourism organisations, particularly in regions where fishing is identified as product strength (as in eastern Victoria, for example). Regions that have highlighted the strength of fishing as part of the tourist experience and are relevant to this study include the Lakes & Wilderness region and the Bays & Peninsulas region. This ‘middle’ market prefers a higher level of accommodation, such as motels, hotels and so on, and generates higher-than-usual yield through extended visitation.

### **6.3 Likely impact of the ECC’s recommendations**

The primary benefit likely to flow from the ECC recommendations – in a tourism context – is the opportunity for increased tourism marketing for the new marine national parks and sanctuaries.

There may also be opportunities for the development of new tourism products, such as new look-outs and vantage points for sea-views, underwater features for those diving and snorkelling, and so on.

There would also be opportunities to link the new marine national parks and sanctuaries with existing land-based national and state parks, and to promote these as integrated attractions for those visitors wishing to experience the comprehensive natural and environmental ‘appeal’ of such localities.

Generally, there would be no negative impacts arising from the ECC’s recommendations as they may affect the tourism market. Tourism numbers are unlikely to boom following the designation of marine national parks or sanctuaries, and therefore additional costs in the provision of new or expanded infrastructure to accommodate these numbers (such as new roads) would not be anticipated.

Some towns that are reliant on ‘fishing’ as an attraction for holidaymakers and tourists may fear restriction on recreational fishing in the marine national parks and sanctuaries would limit the appeal of such towns. However, it is evident that the ECC recommendations take this concern into account, and generally avoid designation of such areas that are already popular fishing recreational fishing destinations, or provide for other accessible and nearby opportunities for these recreational pursuits. These aspects are described in more detail for specific locations in section 5.

In our view, any net tourism benefits arising from the ECC recommendations in the short term are, in realistic terms, likely to be small and not measurable in terms of new jobs and incomes, etc. However, the creation of marine national parks and marine sanctuaries does offer to coastal communities the opportunity to develop new tourism experiences. Over time these assets may become an integral part of the tourism experience offered by coastal towns.

The strongest observation we can make regarding the tourism implications of these recommendations is that it is most unlikely that any net tourism benefits in the short term would balance any potential net losses that could be experienced by the fishing industry in these localities.

## **7. AQUACULTURE POTENTIAL**

The ECC final recommendations provide for commercial access to waters for marine aquaculture, with 12 areas nominated as aquaculture zones. Most of the areas are located in Port Phillip Bay. However, regional centres such as Portland are potential beneficiaries, with industry development generating both employment and new export opportunities.

Nationally, the aquaculture industry is valued at around \$500 million (ABARE 1999), and growth is forecast at 18% per annum until 2005. Victoria's share of this growth can be facilitated through the ECC recommendations.

Tasmania and South Australia provide useful benchmarks in terms of the commercial success of the aquaculture industry. The Tasmanian experience is particularly relevant, with the eight operations in the fin fish industry generating employment of around 800 direct jobs during its 10-year history (Department of Primary Industries, Water and Environment 2000). Many of the new employment opportunities are located in rural and regional towns. Using an employment multiplier for fish processing of 3.5:1 (Department of Primary Industries, Water and Environment, Sea Fisheries Division – personal communication), Tasmania has created approximately 2 000 indirect jobs through the emergence of flow-on industries such as manufacturing of fish products and equipment, downstream processing such as smoking/preparation of fish, and the re-use of fish waste. An education-related industry has also emerged, with Tasmania being one of the few States offering short and long-term courses in aquaculture and marine farming techniques.

Key factors in the viability of the industry include targeting appropriate species for farming, and recognition that the production cycle is a minimum of three years before return is evident. Water temperature is critical in determining the type of species to be farmed. According to Fisheries Victoria, Portland is a good area to grow fin fish, with immediate species including Atlantic salmon, brown and rainbow trout, and blue fin tuna. At this stage, although Fisheries Victoria have received some interest from established operators, commercial operators require investment security prior to any firm commitments being in place.

Drawing on experiences of aquaculture development in Tasmania, the likely direct employment generation for Victoria (if the 12 areas nominated as aquaculture zones are operated by commercial interests) could be as high as 1 200 jobs, but this is only a broad estimate. The actual number of jobs depends on the type and scale of aquaculture activity and enterprise that is undertaken. Portland is likely to be a primary beneficiary, with some level of commercial interest in the site already evident. Even if only one commercial operation goes ahead in an area such as in Portland, this could potentially generate 100 direct jobs and 250 indirect jobs.

## **8. MANAGEMENT AND IMPLEMENTATION OF THE ECC RECOMMENDATIONS**

Additional employment would be created in association with the management of the marine protected zones and associated with the implementation of the recommendations. These additional jobs would be in such areas as enforcement, park management, etc. and would tend to be located in towns close to the parks. Although estimates of this additional employment have not been prepared, employment in management of existing marine protected areas in Victoria suggest that new dedicated positions are established following park declaration such as in the case of Inverloch following the creation of the Bunurong Marine Park. However, whilst employment generation is likely in the implementation and ongoing management of the protected zones, State funding programs will be required to enable the effective management of the marine protected system.

The ECC Final Report identifies infrastructure establishment and maintenance, promotion and interpretation, monitoring, compliance and park management as the key elements in the effective management of the recommended marine protection system. The ECC acknowledge that the cost of implementing recommendations may be partially absorbed from within existing State programs, with other costs potentially offset by industry

contributions such as aquaculture licence fees. However, other costs such as those associated with monitoring and management plans will require additional funding.

## **9. SOCIO-DEMOGRAPHIC AND ECONOMIC TRENDS SINCE 1991 IN THE SELECTED TOWNSHIPS**

### **9.1 Introduction**

This section provides an overview of socio-demographic and economic trends taking place in the nominated towns. The comments are based on an update of ABS Population Census information, as well as other data sources, combined with other commentary where relevant. The information assists in making observations regarding potential impact that the ECC recommendations may have on the social and economic profile of particular towns.

### **9.2 Change in Victorian coastal towns**

As previously indicated in this report (refer section 3.1), many of Victoria's coastal towns (and small towns in general) are undergoing changes that influence the type and extent of economic activity, and directly influence the prospects for local employment.

Many of these changes are being driven by structural change in industry, competition with larger towns and cities, and global factors that have widespread influence on all levels of economic activity and settlement patterns.

Some of these changes are tending to place pressure on existing employment levels, such as the loss of employment in the farm sector due to industry restructure, and the loss of local service employment to larger centres. In other cases there is an increase in local employment as tourism activities take hold, and as service employment opportunities expand in line with growth in the small-town retiree population, and so on.

Awareness of these underlying changes provides us with the ability to assess implications potentially arising from the ECC recommendations and the ways they may affect coastal communities.

The following section provides an overview of the population features of the coastal towns identified by the ECC, and includes an analysis of population change, employment, labour force participation and socio-economic features such as age and income. Where relevant, selected variables are compared to State averages in order to gauge areas of significant change.

The coastal communities identified by the ECC for investigation are:

- Apollo Bay
- Cann River
- Foster, Port Franklin, Port Welshpool, Toora
- Lakes Entrance
- Mallacoota
- Port Campbell
- Portland
- Rhyll
- Seaspray
- Torquay / Anglesea

The primary information source for the socio-economic profile of the towns is the ABS Census 1996; this is provided as an update to the 1991 Census information which underpins the earlier work undertaken by the (then) LCC. The 1996 Census data reports on employed persons by industry, which indicates the industry a resident is

employed. However, the Census does not report the number of jobs actually located in the town. In addition, ABS Business Register data – which reports businesses employing wage and salary earners by standard industry classification – is also provided as an indication to the type of business activity occurring in each of the towns.

A separate report (available in the ECC library) provides a detailed socio-economic profile of each of the towns, including:

- a brief description of each town,
- a summary of the ECC recommendations as they may affect each town,
- a community and industry profile, and
- a profile of businesses in each town.

An outline for each town is provided in the following paragraphs. Note that the population estimates for the year 2000 are based on the average annual growth rates for the period 1991–1996 in each town (ABS Census data). These figures are provided only as an indication of the likely population level at the present time.

### 9.3 Apollo Bay

Apollo Bay is a small settlement (1 050 residents in 2000), but holiday home ownership is high (approximately 50% of dwellings were unoccupied at the time of 1996 Census), reflecting the popularity of this locality for holiday-makers and tourists. The resident population has increased at a rate of +1.8% pa from 1991 to 1996, which is higher than the Victorian average annual growth rate for this period (+0.6%). The resident population is predominantly older (60+), though young families also feature in the age profile. Per capita median income for the town (\$8 680) is significantly lower than for metropolitan Melbourne (\$13 140) and Victoria (\$12 120), and this is influenced by the retiree market that has also developed in the town.

Tourism is a key industry for Apollo Bay, with a high share of visitors to the Great Ocean Road region undertaking a range of passive recreational activities such as going to the beach, driving for pleasure, sightseeing and eating out at restaurants.

Apollo Bay is characterised by an increasing labour force and a slightly decreasing unemployment rate. Both the business profile and the industry of employed persons residing in Apollo Bay indicate that tertiary services (such as retailing, accommodation, cafes and restaurants) are key features of the economic base of the town. Around 57% of residents are employed in consumer services, including a high proportion of employed persons in retailing, accommodation, café and restaurants. Only 7% of residents are employed in agriculture, forestry & fishing.

Apollo Bay is also an active fishing port with an estimated 15 rock lobster boats regularly working the port. A fish processing firm is located in town which employs approximately 5 full-time equivalents (FTEs) (personal communication).

#### *Costs and benefits of the ECC recommendations*

- The town profile indicates Apollo Bay is a consumer services economy with tourism and leisure services the base of the town's economy.
- The proposed changes to marine reserves in Apollo Bay may value add to the existing tourism profile of the town, providing opportunity for increased marketing as a short and long-stay destination offering a variety of nature-based experiences.
- While recreational fishing features in Apollo Bay, the natural assets of the coast also provide opportunity for passive recreational activities such as swimming, walking and sightseeing.
- Anecdotal information provided by the fish processing firm and co-operative suggest the proposed Twelve Apostles MNP and Marango Marine Sanctuaries will adversely impact on the viability of the fish processing operation in Apollo Bay. The suggestion is made by local operators that the processor would be likely to close with the implementation of ECC recommendations resulting in loss of jobs in the town.

## 9.4 Cann River

Cann River is a very small settlement (190 residents) which is experiencing a decline in population numbers. There is a relatively high share of unoccupied dwellings (approximately 31% of dwellings were unoccupied at the time of 1996 Census) which suggests some holiday houses as well as homes left vacant as people seek employment opportunities elsewhere. Per capita income (\$8 980) is significantly lower than for metropolitan Melbourne (\$13 140) and Victoria (\$12 120).

Noting that resident population numbers are declining (about -6% pa), a review of the age profile suggests younger persons are leaving to seek employment or education opportunities elsewhere. The town has a high proportion of young to middle age residents (25-39 and 40-59 yrs), yet a lower share of older persons (60+) and young adults (15-24).

Timber production is the key industry base for the town. Tourism is also an activity for the town, especially as this is a popular fishing base in East Gippsland. Accommodation businesses in the town draw trade from the seasonal fishing trips to the area.

Cann River is characterised by a decreasing labour force and a slightly decreasing unemployment rate. Resident employment is predominantly located in secondary industry (such as manufacturing and construction) with 27% of total employed persons in manufacturing (timber). Leisure services represent around 16% of employed persons. Agriculture, Forestry & Fishing represent 12.5% of total employed persons.

### *Costs and benefits of the ECC recommendations*

- Cann River represents a small rural economy in change, with the on-going timber industry restructuring leading to population outflow.
- The proposed park at Point Hicks near Cann River, while not a threat to the industry structure of the town, could compound the already 'pessimistic' community sentiment. Timber industry restructuring and population decline, particularly among younger persons, has generated a perception that the town is in decline. The perceived loss of access to recreational pursuits such as fishing could further entrench a negative community sentiment.

## 9.5 Foster, Port Franklin, Port Welshpool and Toora

The combined communities of Foster, Port Franklin, Port Welshpool and Toora represent a coastal community of some 1 750 residents.

The resident population is slowly decreasing, with an average rate of decline of -0.8% pa for the period 1991-1996.

The age profile of these localities indicates low proportion of residents in the 25-39 age group; however, the towns have a higher share of older persons (60+) and young adults (15-24 age group).

Manufacturing represents 15.5% of total employed persons, with smaller shares applicable to retailing, health and community services. Agriculture, forestry & fishing represent 10% of total employed persons.

Information on the business profile and the industry of employed persons residing in the towns indicates that manufacturing and consumer services (especially retail trade and accommodation, cafes and restaurants) are among the key industries in these small towns.

The towns are characterised by a decreasing labour force and an increasing unemployment rate. Resident employment is predominantly secondary industry (manufacturing and construction). Manufacturing represents 15.5% of total employed persons; Retail trade and Health and Community Services feature; Agriculture, forestry and fishing represent around 9.5% of total employed persons.

Foster, Port Franklin, Port Welshpool, Toora are towns in change. Unemployment is high and industry restructuring is likely to compound the lack of employment opportunities for the towns' residential populations.

### *Costs and benefits of the ECC recommendations*

- The main potential for the towns is to develop roles as weekend destinations and for tourist/visitor stop-overs associated with visits to SW Gippsland and Wilsons Promontory.
- The proposed changes to marine reserves in proximity to Foster, Port Franklin, Port Welshpool and Toora do not present any adverse implications for the industry structure of the towns.

## **9.6 Lakes Entrance**

Lakes Entrance is a relatively large coastal community (6 015 residents), but also with a high provision of visitor accommodation. It is an important service centre, as well as a popular destination for visitors to the Gippsland Lakes.

The resident population is increasing (+2.6% pa) at a faster rate than for the State. The age profile suggests a mix of young families and older retirees. Per capita income (\$8 390) is lower than for metropolitan Melbourne (\$13 140) and Victoria (\$12 120).

Lakes Entrance is characterised by a slightly increasing labour force and a decreasing unemployment rate. Employment is predominantly tertiary sector (mainly in consumer services), particularly in leisure services and retail trade. Agriculture, forestry & fishing feature at approximately 10% of all employed persons.

The primary economic sector for Lakes Entrance is the tourism industry. Recreation services, retail trade, dining/eateries, and visitor accommodation are among key activities for the town. Whilst Lakes Entrance is a major fishing port, the catch from the proposed parks and sanctuaries is negligible.

### *Costs and benefits of the ECC recommendations*

- The proposed changes to marine protected areas in South and East Gippsland do not present any adverse implications for the structure of industry in the town.

## **9.7 Mallacoota**

Mallacoota is small coastal community of around 1 000 persons, although numbers increase with holidaymakers staying in visitor accommodation and in holiday houses (approximately 34% of dwellings were unoccupied at the time of 1996 Census, and these are mainly holiday houses). The resident population is increasing only slowly (+0.4% pa) and this is slower than the State average (+0.6% pa).

The town's age profile suggests a mix of young families and older retirees with a lower than State average proportion of young adults (15–24; 25–39), but higher share of middle age (40–59 yrs) and older persons (60yrs-plus). Per capita income is lower (\$8 760) than for metropolitan Melbourne (\$13 140) and Victoria (\$12 120).

The town's labour force is slightly increasing in size and the unemployment rate is also increasing. Employment is predominantly tertiary sector, especially in consumer services including education, leisure services and retail trade. 12% of employed persons work in the agriculture, forestry and fishing industry.

Mallacoota is actively promoted as a fishing destination, and an important service and leisure industry has evolved out of this activity. Some 20 fishing areas in and surrounding Mallacoota are promoted for recreational fishing, including the Mallacoota Inlet which is one of the most popular locations. Discussions with Tourism Victoria indicate that Mallacoota is a key fishing destination, and a boat launching facility is under consideration, which would encourage deep-sea fishing tour operations.

Reference to the business profile and the industry of employed persons residing in Mallacoota shows that tourism/holidays and supporting services, retail trade, and manufacturing (specifically seafood processing) form the key industry base for the town.

### ***Costs and benefits of the ECC recommendations***

- Adverse social and economic impacts are likely if the town loses fishing and processing jobs, as this is a large part of the local economy.
- The town is remote and has no surrounding catchment to serve other than locals and visitors, so existing industries in the town are important.
- Potential loss of jobs is difficult to measure and may be unlikely as discussed in section 4.6, but any loss of jobs should be avoided in the view of local impacts.
- Mallacoota is likely to be a location where additional jobs in park management and enforcement may be considered.

## **9.8 Port Campbell**

Port Campbell is a very small coastal community of around 325 residents, plus a significant holiday-home market (approximately 43% of dwellings were unoccupied at the time of 1996 Census, most of which are for holiday use). The resident population is increasing (+3.7% pa) but from a low base.

The age profile indicates the town has a mix of young families and middle-age couples. The town has a high proportion of middle age persons (40–59 yrs) and lower share of older persons and young adults (15–24 yrs).

The town's labour force has grown and a reduction in the unemployment rate is evident. Employment is predominantly tertiary (consumer services) and features leisure services, retail trade and education. Agriculture, forestry & fishing represent around 9.5% of total employed persons.

Tourism and leisure services are key business activities in Port Campbell. The area's diverse coast line and the nature-based experiences it provides are key strengths for the future development of the town.

Visitor accommodation and retailing contribute to the economic base of the town.

### ***Costs and benefits of the ECC recommendations***

- Primary industry does feature in the economic profile of Port Campbell however the general trend is toward a consumer services economy.
- Port Campbell's location in one of Victoria's main tourism regions is evident in the industry base of the town, with tourism and leisure services key activities in the centre's business profile.
- Anecdotal information suggests 3–4 rock lobster boats based at Port Campbell work the Twelve Apostles area, and they would most likely have to fish elsewhere if the recommendation for a marine national park is implemented.

## **9.9 Portland**

Portland is a large coastal community of almost 9 300 residents. However, the resident population base has been slowly declining in numbers (-1.0% pa, 1991–1996).

The age profile of the town suggests a mix of young families and middle age couples. In contrast to smaller coastal communities, Portland's demographic profile is more comparable to Melbourne metropolitan and Victorian averages.

The town's labour force is decreasing in size and the unemployment rate is also decreasing. Employment is predominantly within the secondary industry (manufacturing and construction) and tertiary services sector. Features are Manufacturing (24% of employed persons) and Retailing (14%).

Key activities in Portland are manufacturing and retail trade. Commercial fishing is also a feature of the business profile of the town, with 5 fish processing firms located in the area (personal communication). The town and district however is experiencing a shift from secondary industry to services, especially in leisure and consumer

services. The aluminium smelter is an important industry for the town and the centre's role, as Victoria's major deepwater port, will continue.

#### ***Costs and benefits of the ECC recommendations***

- Portland is undergoing major changes in line with structural change in the broader Victorian and national economies.
- Aquaculture Zones offer potential opportunity for new fishing-related industry in Portland with direct and indirect employment likely.
- Commercial fishing does feature for Portland, however the relative importance of the industry is small when compared to the secondary sector (manufacturing) which appears to drive the town's economy.

### **9.10 Rhyll**

Rhyll is a small coastal community of 430 residents experiencing reasonable growth (3.3% pa). There is a high proportion of holiday homes (approximately 52% of dwellings were unoccupied at the time of 1996 Census, and these are mainly holiday houses).

The town has a high proportion of older persons (44.2%) compared to the State average (15.9%), and the town also has a lower proportion of young dependants, young adults and middle age persons in its population.

Rhyll is a coastal community reliant upon fluctuating visitor inflows (particularly holiday home owners) to maintain the town's small economic base. It is also a residential destination for 'retirees'.

Rhyll's labour force has experienced a slight increase in size and the town is characterised by a decreasing unemployment rate. Employment is predominantly tertiary sector, especially in consumer services such as retail trade and leisure services (including cultural and recreational). Health and community services also feature.

#### ***Costs and benefits of the ECC recommendations***

- The ECC recommendations are likely to have minimal effect on the town.
- Rhyll is a holiday destination and retiree locale, and these roles should continue.

### **9.11 Seaspray**

Seaspray is a very small coastal community (around 200 permanent residents), but it also has a high level of holiday home ownership (approximately 64% of dwellings were unoccupied at the time of 1996 Census). Census data for 1991 and 1996 suggest the town was experiencing a slow decline in population numbers at that time (-1.5% pa 1991–96).

The town's age profile indicates a mix of older retirees and families. The town has a high proportion of older persons (31.2%) compared to the State average (15.9%), and a high share of young dependants (0–14 yrs) and a lower share of young adults and middle age persons.

Seaspray's labour force is decreasing in size whilst a slightly increasing unemployment rate is evident. Retail trade, leisure services, and health & community services are the main areas of employment for residents.

#### ***Costs and benefits of the ECC recommendations***

- The town does not rely on the fishing industry, although recreational fishing is a significant attraction for residents and visitors.
- The ECC recommendations are likely to have no adverse effect on the town.
- There could be some positive tourism effect with the designation of a marine national park, but this is likely to be minimal in terms of economic benefit.

## 9.12 Torquay/Anglesea

Torquay/Anglesea are coastal communities with a combined population base of 9 000 permanent residents. It is also a very popular holiday destination and this is reflected in the high level of holiday home ownership (approximately 46% of dwellings were unoccupied at the time of 1996 Census) and provision of visitor accommodation (motels, camp sites, etc). The resident population is increasing at a significant rate (around 3.3% pa), which is substantially higher than the State average for 1991–1996 (0.6% pa).

The age profile suggests a community with a high share of young families, with a high proportion of residents in the 25–39 year age group and a high share of young dependants (0–14 years). Retirees also feature in the profile of the towns.

The town's labour force has experienced a significant increase whilst the unemployment rate has slightly decreased.

Around 72% of employed residents are engaged in services such as retailing, education and visitor accommodation, while around 25% are employed in the manufacturing and construction industries. Many residents commute to employment in nearby Geelong.

### *Costs and benefits of the ECC recommendations*

- The ECC recommendations are not expected to have any adverse economic effect on the Torquay/Anglesea region.
- Designation of areas for marine national parks and a marine sanctuary may have some positive tourism effect, but the outcome in terms of extra jobs is likely to be negligible in the short term.

## 9.13 Summary

For most of the coastal communities the likely impact of the ECC recommendations will be minimal. Structural changes will continue to occur in these towns in response to restructuring in economic activity in general. Moreover, these changes will continue to occur outside of the influence of the ECC recommendations. However, for some communities such as Cann River, the cumulative social impacts are based on perceptions of loss and a sense of restriction in leisure activities. In other situations (such as Mallacoota) there are concerns that a reduction in catch (due to 'no take' areas) would lead to a loss of employment for fishers and/or for processing operations. Although we have suggested in section 4.6 that the most likely outcome of reduced catch would be reduction in income, responding to such perceptions is a key issue in the communication of the benefits of the ECC policy recommendations.

The following tables provide an overview of the key socio-economic variables and the changes that have occurred in the period 1991–1996 for each of the towns. The tables show that coastal communities, similar to most towns and regional centres, are in the process of change, much of which is driven by economic restructuring on a national and global scale, as well as by changing patterns in lifestyle and choice in place of residence.

**Table 9.1 Socio-economic features of the selected towns 1991–1996**

Coastal towns	Population				Labour force			Unemployment				
	1991	1996	Rate of change pa	Net change	1991	1996	Net change	1991	1996	Rate '91	Rate '96	**Regional rate '99
Apollo Bay	894	979	1.8%	85	397	449	52	50	46	12.6%	10.2%	8.8%
Cann River	336	246	-6.0%	-90	198	136	-62	12	7	6.1%	5.1%	10.5%
Foster Et Al	1 886	1 808	-0.8%	-78	699	684	-15	65	88	9.3%	12.9%	5.9%
Lakes Entrance	4 622	5 248	2.6%	626	1 837	2 019	182	344	308	18.7%	15.3%	10.7%
Mallacoota	961	982	0.4%	21	408	416	8	47	57	11.5%	13.7%	10.5%
Port Campbell	234	281	3.7%	47	108	129	21	16	14	14.8%	12.8%	8.8%
Portland	10 155	9 664	-1.0%	-451	4 707	4 435	-272	769	572	16.3%	12.9%	9.2%
Rhyll	321	378	3.3%	57	120	127	7	18	11	15.0%	8.7%	11.0%
Seaspray	233	216	-1.5%	-17	92	59	-33	9	7	10.0%	11.9%	8.4%
Torquay/Anglesea	6 884	7 979	3.0%	1 095	3 054	3 725	671	403	436	13.2%	11.7%	6.9%

Source: ABS Census Data 1996.

\*\*1999 unemployment rates from Small Area Labour Markets Australia December 1999.

**Table 9.2 Employment by sector in the selected towns – 1996**

Coastal towns	Primary %	Secondary %	Tertiary %	Not stated *NEC %	Total employed persons %
Apollo Bay	8	16	74	2	100
Cann River	12	32	53	3	100
Foster etc.	10	22	65	3	100
Lakes Entrance	11	13	73	3	100
Mallacoota	13	18	68	1	100
Port Campbell	12	6	77	6	100
Portland	3	31	63	3	100
Rhyll	2	5	88	5	100
Seaspray	0	11	89	0	100
Torquay/Anglesea	1	25	72	2	100

Source: ABS Census Data 1996 all figures rounded

\*Note: Note Elsewhere Stated

## 10. CONCLUSIONS

*Socio-economic impacts arising from implementation of the ECC recommendations will be experienced in two ways:*

- in terms of activity levels (for commercial and recreational fishing, tourism, marine aquaculture and park and resource management); and
- in terms of geographic area, depending on the strength of impacts on activities.

*In terms of activities, impacts arising from the ECC recommendations may be experienced in:*

- commercial fishing and related processing activities, with potential reductions in the volume and value of the catch, and potential loss in employment levels if fishers and processors have to reduce their level of activities, or potentially no change if the affected catch is sourced from other areas;
- recreational fishing activities, with potential loss of visitors at popular fishing spots that are now to be protected, and loss of their spending that would otherwise be directed to nearby towns (for accommodation, supplies, etc);
- tourism growth potential where marine national parks and sanctuaries can be marketed as tourist attractions and destinations;
- marine aquaculture, where new or increased operations may generate economic activity; and
- management, with potential new jobs associated with park management and infrastructure.

### *Impact on commercial fishing*

Adverse impacts on commercial fishers are likely to be significant in some cases because:

- fishers will have to fish in other areas (with additional travel and operating costs to the fisher in accessing these alternative areas) and, in turn ...
- this will place greater intensity on these other areas and on the existing fishing operations in these other areas, while ...
- some existing fishing enterprises may have to close (at personal cost unless bought out by a funded scheme), while others ...
- will possibly become involved in illegal activities by continuing to fish in areas now protected from fishing (and this option has been highlighted by industry observers as a very unfortunate but possible outcome for some).

### ***Potential employment impacts***

There may or may not be job losses in fishing, depending on whether or not the catch can be secured from other areas outside parks and sanctuaries. In the unlikely event that none of the lost catch is sourced from other areas, the possible loss of employment for fishers could involve up to 39 jobs (by applying to total employment in fishing, the MAFRI percentage impact figures for value of catch), but we do not believe this would be the case. In any event, this (unlikely) potential for some 39 lost jobs in fishing is equivalent to just 0.3% of all employment in the towns that are located near to the proposed marine parks and sanctuaries. Instead of lost jobs, it is expected that individual incomes will be reduced (unless other areas are fished). The towns providing fishers to these areas would be likely to experience these reduced incomes.

### ***Marine aquaculture***

Employment creation and export opportunities are presented through commercial investment and development in marine aquaculture. Suitable areas are identified for farming of marine species, with the final recommendations focusing on achieving a balance between providing access to aquaculture and minimising the impact on environmental values. Drawing on experiences of aquaculture development in Tasmania, the likely employment generation for the State if the 12 areas nominated as aquaculture zones are operated by commercial interests could be as high as 1 200 jobs, but this is only a broad estimate and should only be used at this stage as an upper limit; in reality the figure might be only around 200 or so jobs, depending on what exactly is developed in the aquaculture zones. Portland is likely to be a primary beneficiary, with some level of commercial interest in the site already evident. However, the production cycle for aquaculture industry is a minimum of three years and the magnitude of export earnings are determined by the selected species for farming (and this in turn is highly dependent on the climatic and water conditions of the nominated sites).

### ***Recreational fishing***

The introduction of restrictions on recreational fishing in the selected coastal areas is unlikely to have any significant adverse effect on recreational fishing expenditures in the State. For local towns, there may be some isolated impacts where fisher visits may decline and therefore their associated spending levels would be reduced. However, these impacts should be limited as accessible alternative fishing areas exist in nearby localities. In some cases, popular recreational fishing areas have been specifically left out of areas reserved for protection. In any event, most fishers are relatively mobile with cars and/or boats and will tend to find alternative fishing locations. Any adverse economic impact is therefore likely to be negligible. Moreover, most towns do not rely heavily on recreational fishing spending, and they will continue to attract holiday-makers who are attracted by a range of factors other than fishing.

### ***Tourism impacts***

The primary benefit likely to flow from the ECC recommendations in a tourism context is the opportunity for increased tourism marketing for the new marine national parks and sanctuaries. Generally, there would be no negative impacts arising from the ECC's recommendations as they may affect the tourism market. Tourism numbers would be unlikely to increase in any significant way as a direct result of the designation of marine national parks or sanctuaries. As a result, additional costs in the provision of new or expanded infrastructure to meet visitor needs would not be anticipated. Increased marketing activity and tourism development generated through the creation of the national parks and sanctuaries may, in the long term, create additional jobs and income for the surrounding communities. Over time, the marketing of the sites may lead to increased visitor demand.

### ***Implementation and park management***

Additional employment would be created in association with the management of the marine protected zones and associated with the implementation of the recommendations. These additional jobs would be in such areas as enforcement, park management, etc. and would tend to be located in towns close to the parks. The likely numbers of such jobs are not yet available.

### ***Impact on towns***

Adverse impacts on towns would be experienced where processing plant and/or fishing co-operatives may have to close if there are reduced levels of product. Although it is unlikely such closures would occur, this study suggests any adverse impacts would be felt in Mallacoota, Portland and Apollo Bay. Impacts could be reflected in a reduction in existing employment levels, possibly with multiplier effects as other suppliers and service providers react to lower levels of activity in the fishing and processing activities. However, the adverse effect on commercial fishing is unlikely to have a lasting adverse effect on the coastal towns. This is because the towns (other than Mallacoota) do not have a strong reliance on commercial fishing or recreational fishing, and are generally reliant on a wider servicing role for local and surrounding resident populations and for tourists.

While the potential loss of commercial fishing activities in a town is important for the individual fishers, the net effect on a town's economy is not expected to be significant. Probably the only potential exception is Mallacoota, where the fishing industry (in both harvesting and processing) is the main economic activity after tourism. Mallacoota is also a town that is distant from large centres or other generators of visitor trips (unlike, say, Torquay, Anglesea, Apollo Bay). However, the large size of the processing firm at Mallacoota makes it less vulnerable to potential impacts.

Some towns that are reliant on recreational fishing as an attraction for tourists and holidaymakers may fear that no-access to recreational fishing in the marine national parks and sanctuaries would limit the appeal of such towns. However, the recommendations take this concern into account and generally avoid designation of such areas that are already popular recreational fishing destinations, or provide for other accessible and nearby opportunities for these recreational pursuits. In our view, any net tourism benefits arising from the ECC recommendations are, in the short term, likely to be negligible in terms of generating new jobs and incomes.

### ***Fishing losses vs employment gains in other areas***

The strongest observation regarding the tourism implications of these recommendations measured against potential loss of employment in fishing is that it is most unlikely that any net tourism benefits would balance anticipated net losses that will be experienced by the fishing industry in these localities.

There are however, very significant opportunities for aquaculture development, and this would lead to new employment creation, which would be sourced from surrounding towns.

Jobs would also be created in the management of the marine protected areas, and in other aspects associated with the implementation of the ECC recommendations (such as in park patrols, enforcement, etc). Estimated numbers of such jobs are not yet available.

Overall, it is likely that any loss in jobs associated with fishing and processing would be more than countered by potential growth in jobs in aquaculture, and in the management and implementation of the ECC recommendations.

### ***Social impacts***

The principal negative social impact is expected to be the potential loss of fishing jobs. This involves more than just the loss of employment for the individual – there is also the difficulty of having to find alternative employment in an environment where there is still relatively high unemployment (double the State average) and where prospects for (often) older males with limited alternative job skills are not great. Another important social impact is that which falls on fishing communities – these communities have generally survived many generations in difficult but challenging conditions. The potential loss of work is therefore a new and threatening change for those involved and for their close-knit communities.

### *Environmental benefits*

The ECC recommendations recognise what is described as the “existence value” of Victoria’s coastal and marine environment, and the recommendations provide the necessary framework within which to ensure conservation and preservation of the State’s unique asset.

Globally, the supply of wild fisheries is levelling and careful management of the resource is required if future generations are to enjoy the benefits of a healthy and diverse marine environment. Sustainable resource management is a goal for most modern economies and the ECC recommendations, enabling the preservation of a proportion of the State’s coastal and marine environment, are an important contribution in managing Victoria’s sensitive marine environment.

Environmental benefits flow from the preservation of the State’s coastal and marine biodiversity. Increased scientific understanding, public appreciation, access to education opportunities and preservation of the State’s unique assets for future generations, are some of the benefits generated through the protection of Victoria’s marine environment. These benefits also have an economic aspect, although the economic value of such benefits is very largely unmeasured in Victoria at this time.

## REFERENCES

- Australian Bureau of Agricultural and Resource Economics, (1998), [www.brs.gov.au](http://www.brs.gov.au)
- Australian Bureau of Statistics, (1997), Australian National Accounts Input-Output Tables 1993–94, Catalogue No 5209.0
- Department of Employment, Workplace Relations and Small Business, (December 1999) *Small Area Labour Markets*
- Department of Infrastructure, (1998) *Regional Victoria in Fact. 1996 Census Statistics for Victoria’s Local Government Areas*
- Department of Infrastructure, (1999) *Towns in Time: Data. 1981, 1986, 1991 and 1996 Census Statistics for Victoria’s Towns and Rural Areas*
- Department of Infrastructure, (2000) *Victoria in Future. The Victorian Government’s Population Projections 1996–2001*
- Environmental Conservation Council, (2000) *Marine Coastal & Estuarine Investigation Final Report*
- Fisheries Victoria, Department of Natural Resources and Environment (July 1997) *Economic Impact of Recreational Fishing in Victoria*
- Fisheries Victoria, Department of Natural Resources and Environment (May 2000) *Fish Fax*
- Li, Eric., Marine and Freshwater Resources Institute (August 1999) *Estimates of Fisheries Resources in Open Coast and Bay and Inlet Study Areas*
- McLennan Magasanik Associates, (April 1997) *Socio-economic assessment of Final Recommendations covering Marine, Coastal and Estuarine Areas in Victoria*
- Royal Automobile Club of Victoria, (1998–1999) *Accommodation Guide*
- TBA Planners, (March 1996) *Victorian Coastal Town Study. A Socio-Economic Profile.*
- Tourism Victoria, (March 2000) *Fishing. Tourism Action Plan 2000–2003.*
- Tourism Victoria, (2000) *Victorian Tourism Research Kit.*
- [www.mallacoota.org/](http://www.mallacoota.org/)
- [www.rfa.gov.au](http://www.rfa.gov.au)

## ATTACHMENT A

Notes from telephone interviews with commercial fishing operators  
and industry representatives

### *Mallacoota*

- Fishing is main industry (other than tourism/services)
- Abalone plant is largest manufacturing activity in town
- Mallacoota is also regarded as a popular recreational fishing destination
- SIV states that 3 abalone quotas under threat (60 tonnes) and equivalent to loss of 6 full-time jobs
- Locals see a potential 13% loss of catch
- Some see loss of 15 jobs in town due to ECC recommendations
- Plant would likely continue even with 13% loss, but this only eats into feasibility of operation; will come a time when closure is considered as an option
- Plant has 25 full-time equivalent (FTE) jobs – this includes about 100 casuals and permanents
- Social impacts on town (increase in unemployment and other problems) can be expected if fishing and related jobs are lost – town relies heavily on fishing
- The town has no surrounding catchment to serve, other than own townspeople and visitors, and hence the importance of maintaining and expanding the fishing industry
- Abalone fishers put investments back into town (eg shops, dwellings)

### *Portland*

- Existing 30 cray boats (60 jobs)
- Existing 20 trawlers (possibly 60–80 jobs, seasonal)
- Existing 4–5 abalone boats from Port Fairy and Warrnambool
- Three processing plants (1 cray/2 for abalone), with about 6 full-time plus 15 or so in season
- One abalone processing plant exports all output (100 tonnes). Employs 12 including 3–4 full-time plus casuals
- \$350 000 pa in wages goes to local economy from 1 plant
- Existing under-supply with quotas, so further reduction with marine national park proposal will aggravate this situation
- ECC recommendations take out several abalone quotas (37 tonnes according to ECC data for Discovery Bay). This would be equivalent to about 4 FTE jobs in this area
- No room to fish elsewhere

### *Port Fairy*

- Fishing industry is a main activity, plus tourism mainly in the summer months
- Abalone processing plant has 6 full-time jobs, plus 30 casual (20 FTE)
- A 10% cut to the abalone quota in ECC recommendations would mean a loss of 18 tonnes pa equivalent to 2 full-time jobs
- Fishing costs likely to increase as would have to fish further out in deeper waters
- Abalone processing costs per tonne would increase if there is less throughput
- Rock lobster fishers will be affected by recommendations for Twelve Apostles Marine National Park

- Any increased recreational use of area, as a marine national park is not likely to be important
- Poaching is likely to increase as the area would no longer be under ‘surveillance’ by fishers on a day-to-day basis

### ***Apollo Bay***

- Rock Lobster is under threat, especially around the Twelve Apostles Marine National Park
- 12–15 cray boats at Apollo Bay, and they are mostly working in the western zone
- 3 abalone boats permanently here, plus other boats that fish in the central zone (from Warrnambool to Wilsons Promontory)
- ECC shows 12.9 tonnes here in rock lobster would be lost, but Apollo Bay and Port Campbell fishers claim it will be greater than this (possibly twice as much, and could even be more than 40 tonnes)
- Apollo Bay Fishing Co-op handles about 80% of catch from this zone. Could have to close (SIV claim) with loss of 3 full-time jobs and 2–3 part-time jobs, plus use of area by abalone fishers for some processing with 2–3 full-time and up to 6 part-time jobs. New marine national parks would likely affect 6–7 licensed boats or 12–14 jobs including owner and deckhand, plus the flow-on effects. Multiplier is around 2.9 for rock lobster (SIV)

### ***Port Campbell***

- 7 cray boats and 2 abalone boats in Port Campbell
- Usually 2 fishers per boat = 18 jobs
- 3–4 boats work this area full-time, so about half of the local fleet (about 9 jobs) operates in the Twelve Apostles area
- With loss of lobster catch, the fleet will fish in other areas and this increases fishing intensity of these other areas, which probably is not sustainable. Cray grounds are only in certain areas
- Industry is already in a 25% reduction mode, and this will be exacerbated with marine national park proposal
- Same situation faces Portland fishers
- Only way to make the proposals work is to buy out the licences, “but how does a 43-year old find a new job when he has no prospects?”

## Appendix 5

### Assessment of commercial fisheries catch and value

The ECC commissioned the Marine and Freshwater Resources Institute (MAFRI) of Fisheries Victoria to assess the commercial fisheries catch weight and dollar value associated with a number of study areas under investigation by the ECC (MAFRI 1999). This assessment was based on catch and effort data over the years 1992/93 to 1996/97 and interviews with commercial fishers, and resulted in estimates of weight and value for abalone, rock lobster and other fisheries for each of the nominated study areas. Where recommended marine national parks or marine sanctuaries in the Final Report are significantly different from the study areas used by MAFRI, or were not assessed directly by MAFRI, estimates have been made with input from MAFRI catch data, the industry, and Fisheries Victoria officers.

Holders of commercial fishing licences are required to submit monthly catch returns which have a range of data about each fishing operation, including species caught, weight of catch, and time and location where the fish were caught. This information is generally referred to as catch and effort data. These data must form the basis of any estimate of the fisheries resources within catch and effort cells (the spatial units for which data is reported and recorded).

Catch and effort data, in most instances, cannot be used alone to assess the potential impact of the ECC's proposals on commercial fisheries, as the spatial resolution of the cells are generally much larger than most proposed marine national parks. Catch and effort cells vary in their resolution between fisheries. Finfish have been reported to cells defined by one degree of latitude and one degree of longitude to 39°S, and abalone according to reef codes which vary in extent and size. Rock lobster catches are apportioned to cells usually 10' of longitude in width.

Following the release of the Draft Report, Seafood Industry Victoria (SIV) and some specific sectors of the commercial fishing industry challenged the MAFRI estimates of catch and value from some of

the proposed marine national parks. In particular, SIV considered that the commercial fisheries catch was under-estimated from the following marine national parks or marine sanctuaries proposed in the Draft Report:

- Twelve Apostles (rock lobster)
- Point Addis (rock lobster)
- Point Cook (abalone)
- Wilsons Promontory (rock lobster, abalone, finfish)
- Corner Inlet (finfish)
- Point Hicks (rock lobster and abalone)
- Cape Howe (rock lobster).

SIV did not comment on estimates for other areas, or fisheries other than those indicated.

Discussions with industry indicate that some of the concern arises from the fact that estimates were based on the most recent year for which full figures were available (1996/97) rather than the current year or averages over several years.

The dollar price per kilogram used to calculate the value of the catch was also queried. In this report, value of the catch has been calculated using 1999 prices for abalone, and 1998/99 average prices for rock lobster. In addition, the industry also felt that the direct value of the catch was not the best measure of the economic value of the fishery as flow-on values were not included. Potential flow-on implications of the recommendations for coastal communities and the State have been addressed in Appendix 4.

The following sections of this appendix include brief descriptions of each of the abalone, rock lobster and finfish fisheries of Victoria, and discuss some of the inherent limitations associated with estimates or claims about the fishery value of proposed marine national parks.



## Abalone

To improve understanding of the potential impacts of proposed marine protected areas on the Victorian abalone fishery, the structure of the Victorian fishery is briefly outlined, and then the catch described from a reef complex over a ten year period.

The Victorian abalone fishery is a limited entry, output managed, fishery based mainly on the species *Haliotis rubra*. It is sub-divided into three zones - the Western, Central and Eastern Zones - and a Total Allowable Catch (TAC) is set annually for each zone. Since the introduction of quota management in 1988 the TACs have remained constant at 280, 700 and 460 tonnes respectively. The TAC is allocated evenly amongst each licence holder within the zone.

Abalone prefer reef substrates with high wave energies and surge, generally dominated by kelps, which offer crevices, gutters and overhangs for protection. These reefs are often concentrated around headlands. The reefs are grouped for management purposes, and each group of reefs is given a reef code. All abalone taken by licensed divers are allocated to a reef code within the zone.

The annual catch from a reef can be used to represent the contribution of a particular reef code to the TAC of the fishery. This contribution will vary depending on natural fluctuations, the physical extent of the reef, its productivity, density of abalone, proximity to a port or boat ramp, price of abalone, weather conditions during a season, and so on. Some reefs may have quite a high productivity, over and above what the size of the reef would suggest, that enable divers to repeatedly harvest over a season, whilst other reefs may only be harvested once a year. To illustrate the variable contribution of a reef to the total catch, the catch from a typical reef complex (the Point Cook Homestead Reef) is described from the introduction of quota management to the fishery in 1988 until the present.

Using catch and effort data supplied (as a legal requirement) by the industry to Fisheries Victoria, the catch from this reef complex has varied between 17.9 tonnes in 1992/93 to 43.6 tonnes in 1998/99, with an average catch of 29.9 tonnes. Expressed in percentage terms the reef's contribution to the Central Zone TAC has varied from 2.6% to 6.2%, with an average of 4.3%. Similar variability is typical for other reef codes in all zones.

This example illustrates how the contribution of an individual reef complex to the TAC of the fishery can vary from year to year. It is also clear that the implications of the proposed marine national parks for the Victorian abalone fishery can be discussed in terms of a range of potential impacts, based on the average weight of abalone produced from reefs within the recommended areas.

In most instances, catch data cannot be used to directly estimate the potential implications of the proposed parks on the abalone fishery as the reef codes are only occasionally completely within the boundaries of the proposed areas. Reef codes that are completely within a proposed park occur at the recommended Discovery Bay Marine National Park, Cape Howe Marine National Park and the Beware Reef Marine Sanctuary. For the Cape Howe Marine National Park, the combined catch of the reefs known as The Howe and the Iron Prince have varied between 1987 and 1997, from a high of about 34 tonnes to a low of 15.6 tonnes. Thus the reefs' contribution to the Eastern Zone TAC has varied from as much as 7.4% to as little as 3.5%. The average contribution in this ten year period is 23.2 tonnes per annum, but if the most recent five years are averaged this contribution falls to 19.5 tonnes per annum. The MAFRI estimate for the proposed Cape Howe Marine National Park is 19.7 tonnes.

The dollar value of the potential impacts on the abalone fishery can vary depending on the price used. In this report the 1999 price of approximately \$34/kg is used.

**Table 5.1 Victorian commercial abalone fishery**

	Western Zone	Central Zone	Eastern Zone
<b>TAC (tonnes)</b>	280	700	460
<b>Number of licences</b>	14	34	23
<b>Diver days</b>	707	1 643	982
<b>Catch rate (kg/hr)</b>	77	85	86



## Rock lobster

As with the abalone fishery, to improve understanding of the potential impacts of proposed marine protected areas on the Victorian rock lobster fishery, the structure of the Victorian fishery is briefly outlined, and then the reported catch from a catch cell is described for a six year period.

The fishery is based on the species *Jasus edwardsii* caught in pots on and adjacent to reefs. The Victorian fishery is sub-divided into eastern and western zones at 143°4' E, just east of Cape Otway. The rock lobster fishery is an input managed fishery, with limited entry, limited pot entitlements, legal minimum sizes, and restricted seasons. Features of the fishery are briefly summarised in Table 5.2 below. It should be noted that there are a number of inactive licences in the fishery or licences with reported catches of less than 100 kg. In 1997/98, there were 28 inactive licences (one in the Western Zone and 27 in the Eastern Zone), and four licences with less than 100 kg reported catch (one in the Western Zone and three in the Eastern Zone).

The MAFRI estimates for rock lobster have been the subject of a number of counter claims by industry. These assertions are more complex to address than similar claims for the abalone fishery. There are three reasons for this:

- the variation in catches between participants in the fishery,
- the lower spatial resolution of the catch and effort data, and
- 'evidence to suggest under reporting of catch' (page 36, Rock Lobster and Giant Crab Quota Allocation Panel 1999).

Under-reporting of catch, in particular, is a problem as the methodology used by MAFRI to estimate the catch within the proposed marine national parks will only reflect the reported (ie legal) catch. In submissions to the Draft Report, there were five areas for which industry claimed that the rock lobster catch is under-estimated. However, the industry's counter claims of catch in the recommended areas exceeded

the entire catch reported to the much larger catch cell in four out of the five claims, and in two instances by more than double.

Rock lobster catch and effort data are apportioned to a catch cell, which is usually much larger than the proposed parks. Cells are usually 10' of longitude across. The catch reported to cells varies for reasons similar to those described above for abalone reefs.

To illustrate how catch from a particular area varies over time, catch code 21 encompassing the recommended Point Addis Marine National Park, is described. This catch code covers the area from 144°10' (west of Point Roadknight) to 144°20' (Horseshoe Bend Rd at Torquay), and south as far as 38°S. The reported catches to a depth of 70 metres from 1992/93 were double that of the 1996/97 catch. Variations of such magnitude are more typical in the Eastern Zone than in the Western Zone. Therefore Eastern Zone estimates will be subject to greater variability than those of the Western Zone.

In the case of abalone there are instances where catch and effort data are an adequate proxy to estimate the potential catch from an area proposed as a marine national park. The rock lobster catch cells, being much larger than the proposed parks, cannot be used to directly estimate the catches, but can offer an upper limit to the potential catch. There are areas other than Point Addis, where the MAFRI estimates seem similarly accurate, but there are some areas where inherent sampling limitations may have led to some underestimates, in particular in relation to the recommended Twelve Apostles and Point Hicks Marine National Parks.

The value of the any catch foregone due to the proposed parks should be considered in the light of intra-annual price movements of rock lobster. As the fishing season (commencing in November) proceeds, the price paid for rock lobster increases; however the landed weight falls substantially after the end of summer. The majority of rock lobster landed is prior to Easter, at prices of \$30/kg or less. In this report values are based on the 1998/99 average price of approximately \$33/kg.

**Table 5.2 Victorian commercial rock lobster fishery**

	Western Zone	Eastern Zone
<b>Number of licences (including inactive licences)</b>	90	69
<b>Total pots</b>	5 388	2 615
<b>Average number of pots per licence</b>	60	38



<b>Catch 1997/98 (tonnes)</b>	436	65
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## Finfish

Fisheries can be defined by species (eg the abalone fishery), area (eg the South East fishery), or gear type (eg the purse seine fishery). The Victorian finfish fishery, as defined for the purposes of this report, is 'the fishery that exists within Victoria's coastal waters and is not abalone or rock lobster'. This includes a wide range of finfish including some shark, caught by a variety of techniques including hooking, mesh nets and long lines. Below is a broad summary of the licensing categories and value of the catch for a number of fisheries that occur within Victorian waters.

The well documented bay and inlet fisheries comprise the majority of the Victorian finfish catch. The value of the finfish caught in open coastal waters has been less well documented. Fisheries Victoria report the weight and value of finfish in annual Catch and Effort Bulletins, as that landed in Victoria. This includes some catch caught outside Victorian waters including South East Fishery (SEF) species such as gemfish and warehou. Similarly,

shark is mostly caught in Commonwealth waters with by-catch allowed from Victorian bays and inlets. To better estimate the potential impact of ECC recommendations, in Table 5.3 below the species that are predominantly SEF species have been removed from the broader catch and effort data.

Finfish estimates are the most difficult to make, primarily due to the mobility of most commercial species, and the number of species with different values and different habitat requirements. For example, in an area proposed as a park, reef habitat may be used to target pinkie snapper, but a poor year for snapper may be a good year for garfish in another part of the recommended park. In the following tables, to fully describe the fisheries catch from each park, where possible the sector or type of fishing within MAFRI's general category of 'other' fisheries eg wrasse, trawl or general is identified. Values are based on 1997/98 catch data unless otherwise noted.

**Table 5.3 Other commercial fisheries in Victoria**

Licence Type	Number of licences (1 June 2000)	Value of catch 1997/98 \$ million
General Ocean Access (open coastal waters)	520	2.3 <sup>1</sup>
Port Phillip Bay and Western Port	53	2.82
Corner Inlet	20	1.26
Gippsland Lakes and Lake Tyers	19	2.13
Mallacoota	4	0.17
Ocean Wrasse	59	0.6

<sup>1</sup> This figure is derived from 1996/97 data.



## Estimates of commercial fisheries catch and value in recommended marine protected areas

These figures are derived from MAFRI (1999) except where estimates have been adjusted to account for changes in the recommended area or as annotated. Note: in the tables below, the letters W, C or E denote the Western, Central or Eastern fishery zones respectively (where applicable).

### *A1 Discovery Bay Marine National Park*

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone W</b>	14 171	480 822	5.1	1.0
<b>Rock Lobster W</b>	14 453	452 812	3.4	2.9
<b>Other</b>	4 018	9 946		

### *A2 Twelve Apostles Marine National Park*

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	22 794	773 400	3.3	1.6
<b>Rock Lobster W</b>	12 853	402 684	3.0	2.6
<b>Other</b>	10 130	39 279		

### *A3 Point Addis Marine National Park*

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	1 638	55 577	0.2	0.1
<b>Rock Lobster E</b>	1 750	54 828	2.6	0.4
<b>Squid</b>	14 700	22 528		
<b>Other</b>	5 719	29 360		

### *B7 Point Cook Marine Sanctuary*

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	23 300	790 569	3.3	1.6
<b>Rock Lobster E</b>	0			
<b>Other</b>	4 903	13 944		

Note: estimate of abalone catch is the average catch from 1988/89 to 1996/97.

### *B9 Ricketts Point Marine Sanctuary*

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	0			
<b>Rock Lobster E</b>	0			
<b>Mesh nets &amp; other</b>	5 246	10 904		



***A4 Port Phillip Heads Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	33 000	1 119 690	4.7	2.3
<b>Rock Lobster E</b>	1 000	31 330	1.5	0.2
<b>Mesh nets &amp; other</b>	negligible			

Note: abalone catch is estimated from a much larger MAFRI study area and much larger catch cells, and should be regarded as an upper limit, especially as catch from this area has reportedly diminished since 1996/97.

***A6 French Island Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	0			
<b>Rock Lobster E</b>	0			
<b>Mesh nets &amp; other</b>	17 496	84 880		

***A7 Churchill Island Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	0			
<b>Rock Lobster E</b>	0			
<b>Mesh nets &amp; other</b>	3 165	11 289		

***A8 Bunurong Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	0			
<b>Rock Lobster E</b>	896	28 072	1.3	0.2
<b>Other</b>	841	5 957		

***A9 Wilsons Promontory Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone C</b>	23 319	791 214	3.3	1.6
<b>Rock Lobster E</b>	1 012	31 706	1.6	0.2
<b>Trawl, seines &amp; other</b>	39 359	137 956		

***A10 Corner Inlet Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone E</b>	0			
<b>Rock Lobster E</b>	0			
<b>Mesh nets &amp; other</b>		100 000		

Note: catch is estimated from 1998/99 catch data.



***B11 Beware Reef Marine Sanctuary***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone E</b>	4 300	145 899	0.9	0.3
<b>Rock Lobster E</b>	500	15 665	0.7	0.1
<b>Other</b>	negligible			

Note: estimate of abalone catch is the average catch from 1988/89 to 1996/97.

***A12 Point Hicks Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone E</b>	16 716	567 157	3.6	1.2
<b>Rock Lobster E</b>	890	27 884	1.3	0.2
<b>Mesh nets &amp; other</b>	13 580	41 791		

***A13 Cape Howe Marine National Park***

Fishery	Weight kg	Value \$	% of zone	% of State total
<b>Abalone E</b>	19 668	667 335	4.3	1.4
<b>Rock Lobster E</b>	61	1 911	0.1	0
<b>Other</b>	28 454	96 579		

**Abalone – Western Zone**

The Western Zone for this fishery runs from the South Australian border to the mouth of the Hopkins River near Warrnambool. Discovery Bay Marine National Park is the only recommended park within the Western Zone of the abalone fishery. The impact on the Western Zone abalone fishery is the loss of grounds that yield approximately 5.1% of the Western Zone catch, with this likely to vary between 4.0% and 6.5%.

**Abalone – Central Zone**

The Central Zone for this fishery runs from the mouth of the Hopkins River at Warrnambool to Lakes Entrance. The combined effect of the recommended Twelve Apostles, Point Addis, Port Phillip Heads and Wilsons Promontory Marine National Parks and the Point Cook Marine Sanctuary is the loss of ground that yield approximately 14.8 % of the Central Zone abalone catch.

**Abalone – Eastern Zone**

The Eastern Zone for this fishery runs from Lakes Entrance to the New South Wales border. The effect of the recommended Point Hicks and Cape Howe Marine National Parks and the Beware Reef Marine Sanctuary on the eastern zone of the abalone fishery is the loss of grounds that have historically provided up to 8.8% of the Eastern Zone catch, varying between 7.9% and 9.4%.

**Rock lobster – Western Zone**

The Western Zone for this fishery runs from the South Australian border to just east of Cape Otway. The recommended Discovery Bay Marine National Park and the Twelve Apostles Marine National Park represent the only two recommended parks within the Western Zone of the rock lobster fishery. The potential impact of the ECC's recommendations are estimated by MAFRI to be loss of grounds that have yielded 6.4% of the Western Zone rock lobster catch. The ECC, in reconsidering these estimates taking into account some of the issues outlined in the above discussion, believes that the impact is potentially higher, perhaps up to 10% of the Western Zone catch.



## **Rock lobster – Eastern Zone**

The Eastern Zone for this fishery runs from just east of Cape Otway to the New South Wales border. The effect of the recommended marine national parks (including Port Phillip Heads), and considering the additional catch of Beware Reef, is the loss of fishing grounds that yield approximately 9% of the zone's catch.

## **Finfish**

The value of the finfish catch from all recommended marine national parks and significant marine sanctuaries was estimated to be \$604 000. This amounts to less than 5% of the catch landed commercially in Victoria in 1996/97. Note: finfish includes all species except abalone and rock lobster.

## **Statewide summary for Victorian commercial fisheries**

The effects of the recommended marine national parks and major marine sanctuaries across the whole Victorian abalone fishery is the loss of grounds that yield approximately 11% of the Victorian commercial abalone harvest, valued at about \$5.4 million per annum (1999 prices). In the case of the Victorian rock lobster fishery, areas that have provided approximately 6.8% of the total catch of rock lobster, valued at about \$1 million per annum (1998/99 average prices) will not be available for harvest. The effect of the proposed marine national parks on Victorian finfish fisheries is the loss of access to grounds that have supplied an estimated 5% of the Victorian landed catch valued at \$0.6 million per annum (1997/98 prices).



## Appendix 6

### Victorian marine ecological data

- 6.1 Summary of marine ecosystem mapping in Victoria (1992 – 2000)
- 6.2 Marine habitat classes and ecological communities
- 6.3 Marine invertebrate species of conservation concern and significant locations



## 6.1 Summary of marine ecosystem mapping in Victoria (1992 – 2000) – adapted from Ferns & Hough (2000)

	<b>Mapping related to the development of bioregions for Victoria 1:1 million</b>	<b>Strategic inshore mapping 1:100,000</b>	<b>Extended mapping of selected offshore areas 1:100,000</b>	<b>Mapping of specific areas for management purposes For the open coast 1:10,000 - 1:25,000</b>	<b>Mapping of specific areas for management purposes For bays and inlets 1:10,000 - 1:25,000</b>
<b>Summary</b>	Broad examination and classification of physical and biological components of Victoria's coastal waters and the Bass Strait. Work supported the development of IMCRA.	Strategic statewide area mapping of Victoria's broad substratum classes within nearshore waters (generally < 30m depth).	Extended mapping of nearshore waters to the 3 nautical mile State Territorial Boundary to assist with the identification of candidate MPAs.	Mapping at specific areas of Victoria's open coast for management and monitoring purposes.	Mapping at specific areas of Victoria's bays and inlets for management and monitoring purposes.
<b>Data collection overview</b>	<p>1. Initially key marine environmental datasets were identified as suitable for the development of a biophysical classification (eg bathymetry, tides, physico-chemical, waves, geology, distribution of biota etc.).</p> <p>2. Physical classification of open coastal waters using multivariate analysis using the variables bathymetry, coastal orientation, tidal levels, currents, wave energy and sea surface temperature.</p> <p>3. Physical classification of Bass Strait using multivariate analysis of physico-chemical properties of seawater.</p> <p>4. Spatial boundaries for bioregions submitted towards the development of IMCRA.</p>	<p>Initially LandSat TM imagery of open coastline nearshore waters supplemented with aerial photo interpretation to produce spatial boundaries of major substratum attributes ranging from 10-50 m depth.</p> <p>(NB: aerial photo interpretation used exclusively for intertidal mapping.)</p> <p>Spatial boundaries and substratum attributes checked through a series of bounce dives, video drops and grab samples.</p> <p>Dominant biota described from observations.</p> <p>(NB: quantitative infauna community and sediment data derived from broad scale sampling of sediments across the open coast.)</p>	<p>Refinement of spatial boundaries and substratum attributes derived from original LandSat TM using hydroacoustic devices (eg RoxAnn and Echo Listener).</p> <p>Spatial boundaries extended to the 3 nautical miles, additional substratum attributes derived from application of hydroacoustic technology.</p> <p>Substratum attributes checked through a series of video drops.</p> <p>Dominant biota described from observations.</p>	<p>Further refinement of spatial boundaries for open coast areas using combined side-scan sonar and Echo Listener devices to achieve fine-scale spatial resolution.</p> <p>Quantitative data on biotic communities inhabiting rocky reefs collected by trained marine biologists. Divers swam a series of stratified 200m belt transects.</p>	<p>Aerial photo interpretation to produce spatial boundaries, mainly depicting macrophyte beds and major substratum attributes.</p> <p>Semi quantitative data on macrophytes. Visual transects using glass bottom observation pod on base of survey vessel.</p> <p>Also video transects using towable camera.</p>
<b>Scale(s)</b>	Nominal scale of 1:1million	Nominal scale of 1:100 000	Nominal scale of 1:100 000	Nominal scale of 1:25 000	Nominal scale of 1:25 000





<b>Data sources</b>	Numerous data sources, see key references for details.	LandSat TM images from ACRES (Band 1, pre-processed to level 9), rectified against AUSLIG 1:100 000 topographic maps. Final processed maps incorporate 1:25 000 coastline.	Collected directly from field sampling.	Collected directly from field sampling.	Rectified colour positive aerial photos, other data collected from field sampling.
<b>Level of ground truthing</b>	Regions derived through modelling and expert opinion. Bioregionalisation provides an initial framework towards delineating the marine environment into broad 'homogeneous' regions.	Bounce dives and video variable, depending on heterogeneity of local area (in total 467 samples to date). Broad-scale systematic sampling of soft sediments involved 46 transects, 20 km apart. Replicate samples taken at 10m, 20m and 40m stations (total of 136 samples).	Selected offshore areas mapped using hydroacoustic devices involving boat transects 200 – 500 m apart using RoxAnn and Echo Listener acoustic devices.	Bunurong area mapped using hydroacoustic devices involving boat transects approx 200 m apart. Note: side scan sonar provides a swath area approximately 120m therefore a mosaic of whole area is generated.	Numerous transects and observation sites (generally <100) in each study area.
<b>Accuracy, precision and resolution of data capture</b>	Varies for original data. Most data point form then modelled into continuous polygon areas using spatial interpolation methods.	DGPS employed throughout surveying. Polygon boundaries accuracy 30m. Attribute accuracy derived from remote sensing interpretation - generally 80% accurate.	DGPS employed throughout surveying. Polygon boundary accuracy 30m. Polygons generated using IDW interpolation of transect data combined with LandSat TM polygons. Attribute accuracy derived from remote sensing interpretation - generally 80% accurate.	DGPS employed throughout surveying. Polygon boundaries accuracy 20m. Attribute accuracy derived from remote sensing interpretation - generally 80% accurate.	DGPS employed throughout surveying. Polygon boundaries accurate within 5-10m. Attribute accuracy derived from remote sensing interpretation - generally 80% accurate.
<b>GIS or other presentation</b>	Available on NRE Marine and Coastal Corporate Geospatial Data Library and Australian Coastal Atlas (see References 157, 235 and 336).	Available on NRE Marine and Coastal Corporate Geospatial Data Library and Australian Coastal Atlas (see References 157, 235 and 336).	Available on NRE Marine and Coastal Corporate Geospatial Data Library and Australian Coastal Atlas (see References 157, 235 and 336).	Soon to be available on NRE Marine and Coastal Corporate Geospatial Data Library and Australian Coastal Atlas (see References 157, 235 and 336).	Available on NRE Marine and Coastal Corporate Geospatial Data Library and Australian Coastal Atlas (see References 157, 235 and 336).
<b>GIS metadata standards used</b>	All data captured according to full ANZLIC Metadata standards.	All data captured according to full ANZLIC Metadata standards.	All data captured according to full ANZLIC Metadata standards.	All data captured according to full ANZLIC Metadata standards.	All data captured according to full ANZLIC Metadata standards.
<b>Coverage</b>	Statewide (and national).	Statewide nearshore waters.	Selected areas.	Bunurong Marine Park.	All major bays, inlets and estuaries across Victoria (Port Phillip Bay to be completed late 2000).
<b>Key references</b>	105, 175 and 377	154, 155, 156 and 158 (See 157, 235 and 336 for work associated with GIS)	154, 332, 333 and 334	158	50, 331 and 337 (Western Port and Port Phillip Bay unpublished)

## 6.2 Marine habitat classes and ecological communities

In Victoria, marine ‘ecosystem’ mapping is conducted on both a strategic and management basis. The scale of mapping for both spatial and attribute detail is therefore dependent on the purpose for which it is required. All the attributes can be represented at different spatial scales, but their use is dependent on the resolution, suitability and availability of the attribute information. Victoria considers an ‘ecosystem’ as a holistic entity. The ‘ecosystem’ is not readily definable at one spatial scale; rather, it is the attributes that form part the ‘ecosystem’ that exist on various spatial scales. The major units that describe Victoria’s ecosystems are described below:

### *Bioregions*

Bioregions are large biogeographic regions that share similar broad-scale physiographic processes. Victoria’s biophysical regions are described by the Victorian Institute of Marine Science *et al.* (1994), which were used nationally for Australia’s IMCRA regions.

### *Marine Habitat Classes (MHCs)*

MHCs are based on dominant habitat attributes that are readily observed by underwater divers, video and remote sensing techniques. We have attempted to construct a logical approach to mapping MHCs by developing standard attribute descriptors that can be selected to be represented at various spatial scales (1:10,000 – 1:100,000). In general the attributes describe the dominant physical and biological structure of marine ‘habitats’. MHC attributes are available for intertidal and subtidal areas (refer Ferns & Hough 1999 for details).

### *Marine Ecological Communities (MECs)*

MECs represent the finest level of ecological community data available and are derived from systematic quantitative sampling of species along 200m belt transects. Currently MECs for macrophytes, invertebrates and fish have been delineated for rocky reefs of the Central Victoria and Flinders bioregions (refer Ferns & Hough 2000 for details).

#### Interim MHC attributes for the intertidal and immediate coastal areas

Description	Intertidal MHC attributes		
Shoreline category	Dune Beach Platform Beach/platform	Reef Cliff (steep or inclined) Lagoon Flat	Artificial seawall
Intertidal area/zone	Coastal/Backshore Supralittoral	Littoral Infralittoral fringe	
Substratum type	Bedrock Bedrock (broken) Bedrock/Rock Cobble	Boulder/Cobble Sand Sand/Gravel Sand/Bedrock	Mud Mud/Sand Artificial structure (ie concrete/wood/metal)
Lithology	Basalt Granite Sandstone	Limestone Calcarenite	
Wave energy/exposure	Low	Moderate	Moderate – High
Dominant structural biota	Coastal scrub Coastal heath Mangrove Salt marsh Seagrass	Fleshy algae–mixed greens Fleshy algae–mixed browns <i>Durvillaea</i> <i>Hormosira</i> Turf algae	Coralline algae <i>Pyura</i> Mussels Barnacles



## Interim MHC attributes for subtidal reef and sand substrata across Victoria

Description	Subtidal MHC attributes		
Substratum type	<b>Reef</b>	<b>Sediment</b>	
Substratum relief*	Low profile (reef) Heavy (reef)	Flat (sand / mud) Ripples (sand) Gently undulating ridges (sand) Steeply undulating ridges (sand)	
Substratum texture#	Solid Broken (boulders/slabs/bommies) Cobbles Rubble/Pebbles/Gravel	Gutters	Coarse sand Medium sand Fine sand Muddy sand Mud/silt Shelly rubble/grit
Substratum consistency	Continuous	Patchy	
Lithology	Basalt Granite Sandstone	Limestone Calcarenite	
Dominant reef biota**	Kelp – <i>Phyllospora</i> dominated Kelp – <i>Macrocystis</i> dominated Kelp – <i>Durvillaea</i> dominated Kelp - <i>Ecklonia</i> dominated Kelp – Mixed <i>Phyllospora/Ecklonia</i> Mixed algae - Brown algae dominated Mixed algae – other	<i>Cystophora</i> <i>Amphibolis</i> <i>Cystophora/ Amphibolis</i> Red algae dominated Sessile invertebrates (eg sponges) Urchin barrens	
Reef understorey biota**	Encrusting coralline algae Mixed red algae Sessile invertebrates	<i>Caulerpa</i> dominated Mixed algae <i>Plocamium</i> dominated	
Dominant sediment biota**	<i>Halophila</i> <i>Posidonia</i> <i>Amphibolis</i> <i>Zostera</i>	<i>Heterozostera</i> <i>Ruppia</i> Mixed seagrass/algae <i>Caulerpa</i> dominated	Mixed <i>Zostera/Posidonia/Halophila</i> Mixed <i>Posidonia/Halophila</i> Mixed <i>Zostera/Posidonia</i> Mixed <i>Zostera/Halophila</i>
Seagrass density	Sparse	Medium	Dense

**\* Substratum relief descriptions**

Low profile reef = relief < 1 m.

Heavy reef = relief >1 m.

Flat = surface predominantly smooth without noticeable rises or depressions.

Ripples = obvious rises up to 0.3 m in height.

Gently undulating ridges = rises > 0.3 m in height, gradually sloping between successive troughs and rises.

Steeply undulating ridges = rises > 0.3 m in height, steeply sloping between successive troughs and rises.

**# Substratum texture descriptions**

Solid = solid rock, not obviously broken into fragments.

Broken (boulders/slabs/bommies) = rock fragments >30 cm diameter or expanses of broken reef termed 'slabs' or 'bommies'.

Cobble = rock fragments 10 cm - 30 cm diameter.

Rubble/Gravel/Pebbles = small or irregular rock particles 4 mm – 10 cm in diameter.

Gutters = gutter-like depressions or chutes between rock facies, often filled with sediment.

Coarse sand = 0.5 mm – 1 mm diameter.

Medium sand = 0.25 mm – 0.5 mm diameter.

Fine sand = 0.125 mm – 0.25 mm diameter.

Muddy sand = mixture of sand and mud.

Mud/silt = < 0.031 mm diameter.

Shelly rubble/grit = sediment composed of shelly debris.



**Detailed descriptions of selected MHC attributes for reef and sediment biota**

MHC attribute	Detailed description
<i>Durvillaea</i>	<i>Durvillaea potatorum</i> forms a dense fringe just beyond the intertidal zone on exposed coasts across Victoria. <i>Durvillaea</i> can occur in lower depths (to 15 m) at very exposed locations.
<i>Phyllospora/Ecklonia</i>	The large brown algae <i>Phyllospora comosa</i> and <i>Ecklonia radiata</i> form canopies in many exposed open coast localities across Victoria (2-15 m depth). Both algae usually co-occur, however, <i>Phyllospora</i> can form single stands at shallow depths (5 m), and <i>Ecklonia</i> can dominate in slightly deeper water (10 m), particularly in far east Gippsland. Other larger algae present include <i>Cystophora platylobium</i> and <i>Seirococcus axillaris</i> . The understory consists of red algae and sessile invertebrates.
<i>Macrocystis</i>	<i>Macrocystis angustifolia</i> forms canopies in isolated patches across Victoria from the far west to Wilsons Promontory (and possible to Cape Conran). <i>Macrocystis</i> was not covered in Part 2 of this inventory report as it occurred infrequently. Consequently there is no data to determine whether the assemblages in <i>Macrocystis</i> beds differ from those elsewhere. Nevertheless there is evidence from Tasmania that fish assemblages differ in <i>Macrocystis</i> beds (eg Edmunds 1990).
Mixed algae	A mixed algal assemblage exists in shallow waters (1-5 m) on sheltered to moderately exposed coasts. This assemblage extends subtidally on some coasts (eg Bunurong) to 15 m. No one algal species dominates. Species include brown algae (eg <i>Cystophora</i> spp, <i>Sargassum</i> spp, <i>Acrocarpia paniculata</i> , <i>Zonaria</i> spp, <i>Ecklonia radiata</i> ), green algae ( <i>Caulerpa</i> spp, <i>Codium</i> spp), and red algae (eg <i>Sonderopelta coriacea</i> , <i>Plocamium</i> spp, <i>Phacelocarpus peperocarpus</i> , various coralline algae).
Urchin “barrens”	The urchin <i>Centrostephanus rodgersii</i> forms large “barrens” in far east Gippsland. These barrens can cover several hundred square metres. Vegetation in these areas is restricted to crustose coralline algae. The common sea-urchin <i>Helicoidaris erythrogramma</i> rarely forms large barrens.
Red algae	Red algae can dominate reefs when they are ephemeral (eg periodically covered by shifting sand) or in poor light (ie deep reefs or in turbid waters).
<i>Amphibolis</i> seagrass	<i>Amphibolis antarctica</i> can form large beds, in sandy areas or on flat low profile reefs, in shallow water (1-7 m), on sheltered to moderately exposed coasts. It is common in small bays on the open coast or on the sheltered side of inshore reefs. <i>Amphibolis</i> beds can contain some large brown algae (eg <i>Cystophora</i> ) if there are exposed patches of rock or stones. <i>Amphibolis</i> extends from western Victoria to the eastern side of Wilsons Promontory.
<i>Caulerpa</i>	<i>Caulerpa</i> species can form large patches in shallow water (1-5 m) in sandy areas adjacent to rocky reefs or in sheltered bays (eg Westernport). Common patch-forming species include <i>C. brownii</i> and <i>C. cactoides</i> . <i>Caulerpa</i> beds often merge with adjacent seagrass beds.
<i>Heterozostera</i> seagrass	<i>Heterozostera tasmanica</i> covers patches of sand in sheltered bays, and occasionally on the open coast, in shallow water (1-10 m).
<i>Posidonia</i> seagrass	<i>Posidonia australis</i> forms large beds in Corner Inlet and in small isolated patches elsewhere (Barwon Heads and Great Glennie Island).
Sessile invertebrates	Sessile invertebrates dominate reefs in poor light (eg in turbid or deep water). These invertebrates include sponges, bryozoans and cnidarians (gorgonians, antipatharians, hydroids) etc. Future studies may show that this habitat is heterogeneric and requires subdivision.



### ***Macrophyte MECs of Victoria (Cental Victoria and Flinders bioregions)***

<b>MEC Category</b>	<b>Description</b>
M1	Mixed browns dominated by <i>Acrocarpia paniculata</i> , <i>Cystophora retorta</i> , <i>Seirococcus axillaris</i> and the seagrass <i>Amphibolis antarctica</i> . <i>Phyllospora</i> absent, <i>Ecklonia radiata</i> uncommon. <i>Macrocystis angustifolia</i> present in small patches. Erect coralline algae abundant. Locality: south and east Bunurong.
M2	Mixed browns dominated by <i>Cystophora moniliformis</i> , <i>Cystophora retroflexa</i> , <i>Cystophora retorta</i> , <i>Acrocarpia paniculata</i> and <i>Macrocystis angustifolia</i> . Erect coralline algae abundant. Fleshy red algae not abundant. Locality: east Pyramid Rock, Phillip Island.
M3	<i>Phyllospora comosa</i> dominated assemblage. <i>Acrocarpia paniculata</i> , <i>Macrocystis angustifolia</i> , <i>Cystophora</i> spp and other browns also abundant. Understorey and open turfs of erect coralline algae and fleshy red algae, including <i>Haliptilon</i> , <i>Amphiroa</i> and <i>Phaeocarpus</i> . <i>Ecklonia</i> uncommon. Locality: Phillip Island.
M4	<i>Phyllospora-Ecklonia-Cystophora retorta</i> dominated assemblage. <i>Acrocarpia paniculata</i> , <i>Carpoglossum confluens</i> and <i>Cystophora platylobium</i> abundant. Understorey of fleshy red algae including <i>Pterocladia lucida</i> , <i>Melanthalia obtusata</i> , <i>Plocamium</i> spp, <i>Phaeocarpus peperocarpus</i> . Locality: Lonsdale Back Beach.
M5	<i>Ecklonia</i> dominated assemblage. Fleshy red algal species abundant (similar species to MEC Category M4). <i>Phyllospora</i> absent.
M6	<i>Ecklonia-Phyllospora</i> dominated assemblage. <i>Seirococcus axillaris</i> , <i>Carpoglossum confluens</i> , <i>Sargassum</i> species abundant and fleshy red algal species abundant. Locality: northwest (Shellback Island) and northeast Wilsons Promontory (from north Waterloo Bay).
M7	<i>Phyllospora</i> dominated assemblage. <i>Ecklonia</i> abundant. Understorey of fleshy and coralline red algae common but in low abundance. High cover of encrusting coralline algae. Other browns present but in very low abundance. <i>Durvillaea</i> may be present in the shallow sub-littoral zone. Locality: Lonsdale Bay; Cape Woolamai; midwest, south to mid-eastern Wilsons Promontory.
M8	<i>Phyllospora</i> and <i>Durvillaea</i> assemblage, <i>Durvillaea</i> occurring to considerable depth (>3 m). Understorey algae generally absent. High cover of encrusting coralline algae. Locality: Cape Schanck; Cape Otway.
M9	Low to medium cover of large brown algal species, either mixed or monospecific (generally less than 50% cover). Sparse to patchy stands of <i>Phyllospora</i> , <i>Macrocystis</i> , <i>Ecklonia</i> and <i>Acrocarpia</i> . High cover of encrusting and erect coralline algae, including <i>Haliptilon</i> , <i>Metagoniolithon</i> and <i>Cheilosporum</i> . <i>Haloeteris</i> , <i>Caulerpa flexilis</i> , <i>Caulerpa obscura</i> and <i>Sonderopelta</i> common. Locality: Flinders to Cape Schanck.

### ***Invertebrate MECs of Victoria (Cental Victoria and Flinders bioregions)***

<b>MEC Category</b>	<b>Description</b>
IN1	<i>Heliocidaris erythrogramma</i> , <i>Haliotis rubra</i> and <i>Cenolia trichoptera</i> very abundant. High diversity of sea star species with characteristic species including <i>Nectria ocellata</i> , <i>Nectria macrobrachia</i> , <i>Patiriella brevispina</i> , and <i>Petricia vernicina</i> . Location: Wilsons Promontory.
IN2	<i>Haliotis rubra</i> and <i>Turbo undulatus</i> the most abundant species. <i>Dicathais orbita</i> , <i>Plagusia chabrus</i> and <i>Patiriella brevispina</i> also common. <i>Heliocidaris erythrogramma</i> not abundant. Locations: Lonsdale Bay, Lonsdale Back Beach, Phillip Island and Bunurong.
IN3	<i>Haliotis rubra</i> , <i>Haliotis laevigata</i> , <i>Heliocidaris erythrogramma</i> and <i>Patiriella brevispina</i> the most abundant species. Locations: Port Phillip Heads and Bunurong.
IN4	All species low in abundance. <i>Haliotis rubra</i> the most abundant. Other characteristic species: <i>Nectria ocellata</i> , <i>Nectria macrobrachia</i> , <i>Fromia polypora</i> and <i>Tosia australis</i> . Location: from Gunnamatta to Cape Schanck.
IN5	<i>Cenolia trichoptera</i> abundant, all other species relatively low in abundance, including <i>Haliotis rubra</i> . Location: south of Waratah Bay.



***Fish MECs of Victoria (Central Victoria and Flinders bioregions)***

<b>MEC</b>	
<b>Category</b>	<b>Description</b>
F1	Dominant species are <i>Notolabrus tetricus</i> , <i>Odax cyanomelas</i> , <i>Scorpius aequipinnis</i> , <i>Notolabrus fucicola</i> and <i>Cheilodactylus nigripes</i> . Other characteristic species include <i>Parma victoriae</i> , <i>Pictilabrus laticlavus</i> , <i>Meeschenia hippocrepis</i> and <i>Aplodactylus arcidens</i> . Locations: Lonsdale Back Beach, Phillip Island and Bunurong.
F2	Dominant species are <i>Notolabrus tetricus</i> , <i>Odax cyanomelas</i> , <i>Parma victoriae</i> and <i>Cheilodactylus nigripes</i> . <i>Scorpius aequipinnis</i> and <i>Notolabrus fucicola</i> are generally low in abundance. Other characteristic species include <i>Pictilabrus laticlavus</i> , <i>Upeneichthys vlamingii</i> , <i>Meeschenia hippocrepis</i> and <i>Meeschenia flavolineata</i> . Location: Port Phillip Heads.
F3	Dominant species are <i>Caesioperca rasor</i> , <i>Notolabrus tetricus</i> , <i>Notolabrus fucicola</i> , <i>Dinolestes lewini</i> and <i>Odax cyanomelas</i> . Other characteristic species are: <i>Acanthaluteres vittiger</i> , <i>Enoplosus armatus</i> , <i>Cheilodactylus nigripes</i> , <i>Scorpius aequipinnis</i> and <i>Trachinops caudimaculatus</i> . Location: western Wilsons Promontory.
F4	Dominant species are <i>Caesioperca rasor</i> , <i>Notolabrus tetricus</i> and <i>Dinolestes lewini</i> . Other characteristic species are: <i>Cheilodactylus nigripes</i> , <i>Scorpius aequipinnis</i> , <i>Scorpius lineolata</i> , <i>Atypichthys strigatus</i> and <i>Latridopsis forsteri</i> . Location: eastern Wilsons Promontory.



### 6.3 Marine invertebrate species of conservation concern and significant locations

Recommended marine invertebrate species to be listed as threatened under *Victoria's Flora and Fauna Guarantee Act 1988* (O'Hara & Barmby 2000). Species denoted \* recorded in existing MPA, species denoted # recorded in ECC recommended marine protected area.

Species	Locality	IUCN threat category and criteria	Scale of threat
<i>Haliscarinus</i> sp # (undescribed) Crab	Delray Beach to Woodside Beach	Vulnerable, D2	Global
<i>Athanopsis australis</i> # Ghost shrimp	Bridgewater Bay and Corio Bay and Beaumaris	Vulnerable, D2, B2c	Global
<i>Eucalliax tooradin</i> *# Ghost shrimp	Swan Bay (Port Phillip Bay and Cribb Point (Western Port)	Vulnerable, D2, B2c	Global
<i>Michelea microphylla</i> Ghost shrimp	Crib Point	Vulnerable, D2, B2c	Global
<i>Amphiura triscacantha</i> * Brittle-star	South of Sunday Island, North Arm of Western Port	Vulnerable, B2c	Within Victoria
<i>Ophiocolina australis</i> * Brittle-star	South of Sunday Island	Vulnerable, B2c	Within Victoria
<i>Apsolidium densum</i> # Sea-cucumber	Mushroom Reef (off Flinders)	Vulnerable, D2	Global
<i>Apsolidium handrecki</i> Sea-cucumber	Merricks (Western Port)	Vulnerable, D2	Within Victoria
<i>Pentocnus bursatus</i> * Sea-cucumber	Cape Patterson	Vulnerable, D2	Within Victoria
<i>Thyone nigra</i> Sea-cucumber	Corio Bay (Port Phillip Bay)	Vulnerable, B2c	Within Victoria
<i>Trochodota shepberdi</i> * Sea-cucumber	South of Sunday Island	Vulnerable, B2c	Within Victoria
<i>Bassethulia glypta</i> # Chiton	Port Phillip Heads, Mushroom Reef (off Flinders)	Vulnerable, D2	Global

Note: B2c = Small distribution; fragmented habitat decline in area or habitat. D2 = Very small distribution at threatened locations.



**Significant shallow- water sites (0-20 m) for marine invertebrate species within Victoria (O'Hara & Barmby 2000)**

<b>Location</b>	<b>Species</b>
Cape Bridgewater Bay (Horseshoe Reef)	<i>Athanoopsis australis</i>
Skenes Creek (10 km NE of Apollo Bay)	<i>Apsolidium densum</i>
<b>Port Phillip Bay:</b> <ul style="list-style-type: none"> <li>• Swan Bay</li> <li>• Northern Corio Bay from Pt Abeona to Pt Wilson</li> <li>• Beaumaris</li> <li>• Port Phillip Heads</li> </ul>	<i>Eucalliax tooradin</i> <i>Tlyone nigra</i> <i>Athanoopsis australis</i> <i>Bassethulia glypta</i>
<b>Flinders (Mushroom Reef)</b>	<i>Apsolidium densum</i> , <i>Bassethulia glypta</i>
Western Port: <ul style="list-style-type: none"> <li>• Merricks (shore platform)</li> <li>• Off Crib Point</li> <li>• San Remo (reef flat)</li> </ul>	<i>Apsolidium handrecki</i> <i>Eucalliax tooradin</i> , <i>Michelea microphylla</i> <i>Platydoris galbanus</i> , <i>Rhodope</i> sp, (11 other undescribed opisthobranch molluscs are also known only from this site)
<b>Cape Paterson (boat ramp)</b>	<i>Pentocnus bursatus</i>
Nooramunga: <ul style="list-style-type: none"> <li>• NE of Snake Island</li> <li>• S of Sunday Island</li> </ul>	<i>Ophiocomina australis</i> , <i>Trochodota shepherdii</i> <i>Amphiura triscacantha</i>
<b>Off Delray/Woodside Beaches</b>	<i>Haliscarcinus</i> sp, <i>Platydoris galbana</i>



## Appendix 7

### Technical criteria for marine aquaculture sites

#### Marine-based sites

	Shellfish	Finfish
Water depth	For subtidal species minimum depth of 10 m to 25 m generally preferred.	Minimum depth of 12 m with more than 20 m preferred.
Waves	Generally maximum wave heights less than 2 m. Wave period (which defines wave steepness) should be more than 5 seconds.	Generally maximum wave height of 2–3 m. Costs increase significantly with waves greater than 3 m.
Salinity	Salinity levels need to be considered for individual species.	
Water temperatures	Of less significance than for finfish, however, increased growth rates may be achieved where temperatures are at the higher end of the natural range for the species.	Water temperatures directly influence physiological processes including growth. Higher end of natural temperature range is advantageous for growth, dependent on the species. Cold water species (e.g. Atlantic Salmon) will require production strategies that minimise the impact of high summer water temperatures in Victoria.
Contamination	Sites should not be in downstream proximity to effluent outfalls and heavy metal contamination and faecal coliform counts should be within set limits.	
Nutrient status of water	Prefer low to moderate nutrient status. Excessive levels can lead to reduction in water quality, increased fouling and blooms of undesirable species.	Not directly significant, however, nutrients may influence the extent of marine biofouling on sea pen nets.
Algal blooms	Areas with no known history of algal blooms preferred. Known algal bloom areas may be acceptable where there are other benefits (e.g. high nutrient water) and where blooms are either rare or predictable so that stock can be moved. In the latter case alternative sites would also be required.	Generally prefer moderate to low seasonal algal blooms. Excessive blooms of specific species can cause major problems resulting in mortality of fish.
Currents and flushing	Within range of 5–50 cm per second av. current. Greater current speeds will require additional mooring design consideration.	Within range of 5–50 cm per second av. current. Problems in managing equipment at speeds greater than 50 cm per second.
	Flushing (or water exchange) may be less significant for shellfish compared with intensive finfish farming. Well flushed sites enable adequate oxygen exchange, dispersal of organic sediment outputs and reduce competition for nutrients (eg. filter-feeding shellfish). Shellfish are liable to remove nutrients from the water while finfish are liable to add matter to the water over a localised area. For these reasons aquaculture sites should operate well within defined boundaries with adequate separation from high conservation value sites, e.g. marine protected areas.	
Wind	Areas with some protection from prevailing winds are preferred. Boat access and serviceability is limited where winds (greater than 20–30 knots) over an extended fetch generate unsuitable wave climate.	
Sea floor	Generally prefer sandy sea floors while avoiding areas such as reefs and seagrass beds with high environmental and other values. Areas where benthos recovery time from any effects which are likely to be slow should also be avoided.	
Area available	Designated areas should be large enough to meet the following criteria: of sufficient size for a viable industry with reasonable economies of scale; room for a number of separate licence areas; sufficient space between sites to reduce the risk of spread of disease and to enable general access between farmed areas; the total area needs to be of sufficient size to allow regular fallowing of actually utilised sites. The figures below are indicative of intensity of use within lease areas.	
	At any one time ~50% of area in use. Within this area intensity of use would be low with normally 10–20 m between surface long lines.	At any one time around 5% of actual lease area would be in use to allow for rotation of pens. Pens are usually about 25 m in diameter.
Access	Areas should be in reasonable proximity to land-based infrastructure. Access is more important for finfish where generally daily access will be required. Remote stations on aquaculture sites (houseboats etc.) have been established overseas, however this will increase production costs.	
Land-based infrastructure	For some species (e.g. mussels) grading and cleaning generally done at sea. Require port or jetty with loading and unloading facilities, vehicle access and vessel mooring.	Generally more land-based infrastructure required than for shellfish. Harvest, grading and processing facilities generally required close to port with cool store and feed storage.
Visual impact	Low profile dark flotation is desirable to reduce visual impact. Where biological characteristics allow, sub surface flotation could be used to reduce visual impact.	Areas should preferably be where visual impact will be minimised.



***Land-based sites***

Salinity of water source	Salinity levels need to be considered for individual species.
Water temperature	This will often be controlled on site. Preference for stable source with gradual seasonal changes.
Contamination	Water intake site should not be in a downstream proximity to effluent outfalls and heavy metal contamination and faecal coliform counts should be within set limits.
Nutrient status of water	For certain shellfish species a higher level is preferred.
Turbidity	Low turbidity water is preferred.
Algal blooms	Areas with no (or very low) history of algal blooms are preferred.
Water intake site	Site should be where environmental effects of the intake and pipeline are acceptable and where pumping requirements are minimised. Deeper intake gives cleaner water and more stable water properties.
Waste discharge	Ideally land-based aquaculture should aim for zero discharge, but this will not always be practicable. Any discharge should be subject to EPA works approval and should be adequately separated from high conservation value sites (eg. marine protected areas) and possibly high recreation use areas.
Area available	Visible impact should be able to be minimised. Where private land is utilised, the proposal will need to meet the required planning provisions. Where public land is utilised, it must be demonstrated that the proposal is the most appropriate use for the land from a whole-of-community perspective.

