

# 1 Purpose vs Performance: What does marine protected area success look like?

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14

## 15 **Abstract:**

16 Marine protected areas (MPAs) are an increasingly deployed spatial management tool. MPAs  
17 are primarily designed for biodiversity conservation, with their success commonly measured  
18 using a narrow suite of ecological indicators. However, for MPAs to achieve their biodiversity  
19 conservation goals they require community support, which is dependent on wider social,  
20 economic and political factors. Despite this, research into the human dimensions of MPAs  
21 continues to lag behind our understanding of ecological responses to MPA protection. Here,  
22 we explore stakeholders' perceptions of what MPA success is. We conducted a series of  
23 semi-structured interviews and focus groups with a diverse group of stakeholders local to a  
24 South Australian MPA. What constitutes success varied by stakeholder group, and  
25 stakeholders' stated understanding of the purpose of the MPA differed from how they would  
26 choose to measure the MPA's success. Indeed, all interviewees stated that the primary  
27 purpose of the MPA was ecological, yet almost all (>90%) would measure the success of the  
28 MPA using social and economic measures, either exclusively or in conjunction with ecological  
29 ones. Many respondents also stated that social and economic factors were key to the MPA  
30 achieving ongoing/future success. Respondents generated a large range of novel socio-  
31 economic measures of MPA success, many of which could be incorporated into monitoring  
32 programs for relatively little additional cost. These findings also show that success is not  
33 straightforward and what constitutes success depends on who you ask. Even where an MPA's  
34 primary ecological purpose is acknowledged by stakeholders, stakeholders are likely to only  
35 consider the MPA a success if its designation also demonstrates social and economic benefits  
36 to their communities. To achieve local stakeholder support MPAs and associated monitoring  
37 programs need to be designed for a variety of success criteria in mind, criteria which reflect  
38 the priorities and needs of the adjacent communities as well as national and international  
39 conservation objectives.

40

41

42 **Highlights:**

- 43 • What constitutes MPA success is complex and perceptions of success vary by  
44 stakeholder group
- 45 • Stakeholders are likely to judge the success of an MPA using criteria other than the  
46 stated designation purpose
- 47 • Local communities may fail to consider an MPA successful unless it demonstrates  
48 social and economic benefits in addition to ecological ones
- 49 • Achievement of biological success can be dependent on achievement of socio-  
50 economic successes
- 51 • We provide a large list of novel, stakeholder generated, success indicators which  
52 could be used in monitoring programs

53

54 **Key words:**

55 Stakeholders, conservation, marine management, community engagement, biodiversity,  
56 stewardship

57

58 **1. Introduction**

59

60 Marine protected areas (MPAs) are an increasingly used management tool in marine and  
61 coastal ecosystems around the world (Pita et al., 2011). Within an MPA activities are  
62 managed or prohibited in order to protect or restore features of interest (Kelleher and  
63 Kenchington, 1992). MPAs vary in their levels of protection from multiple-use parks in which  
64 only certain activities are restricted, to strictly no-go areas where all forms of extractive,  
65 depositional and recreational uses are prohibited. Evidence for the conservation benefits of  
66 MPAs have been widely published, with the greatest benefits usually attributed to areas with  
67 the highest levels of protection (Edgar et al., 2014). MPAs have been shown to harbour  
68 increased biodiversity, as well as increases in the density and average size of previously  
69 targeted species (Alcala and Russ, 1990; Halpern, 2003). MPAs can also protect habitats,  
70 critical ecosystem functions and promote long term ecosystem resilience (Gell and Roberts,  
71 2003; Hughes et al., 2005; Micheli et al., 2012). There is growing evidence of the ability of  
72 some MPAs to enhance fisheries through the spill-over of larvae or adult fish into adjacent or

73 nearby fishing grounds (Beukers-Stewart et al., 2005; Russ and Alcala, 2011; Harrison et al.,  
74 2012). Today, >14,000 MPAs have been designated, covering approximately 4.1% of the  
75 oceans and 10.2% of coastal areas under national jurisdiction (UNEP-WCMA & IUCN, 2016)

76

77 While MPAs are most often designated for the purposes of biodiversity conservation, there  
78 are also social and economic consequences related to their establishment (Agardy, 1993;  
79 Farrow, 1996; Pomeroy et al., 2006; Wahle and Lyons, 2003). MPAs have been shown to  
80 benefit local communities through increased economic opportunities and alternative  
81 livelihoods provision (Rees et al., 2015), but there have also been negative effects on  
82 communities as a result of increasing conflict, or inequitable distribution of wealth (Bennett  
83 and Dearden, 2014; Christie et al., 2003). Research into the social context of MPA planning  
84 and management has been increased in recent years. In particular, there is growing evidence  
85 that stakeholder support of MPAs, including their input to the planning, designation and  
86 management processes, plays a critical role in enabling MPAs to achieve their conservation  
87 goals (e.g. Di Franco et al., 2016; Himes, 2007). However, our understanding of the human  
88 dimensions of MPAs, that is, how communities respond to MPA establishment and how these  
89 responses impact upon MPA performance, still lags behind our understanding of the  
90 ecological aspects of MPAs (Badalamenti et al., 2000; Christie, 2004).

91

92 To date, success of MPAs has generally been measured in terms of meeting biological  
93 objectives, such as increased biodiversity or biomass (Alcala and Russ, 1990; Harrison et al.,  
94 2012; Russ and Alcala, 2011). Whilst understandable, given that one of the main drivers for  
95 MPA creation is the International Convention on the Conservation of Biodiversity (CBD), this  
96 narrow view of success does not incorporate any of the human dimensions of MPAs. This  
97 narrow view also fails to take into account the CBD's revised strategy and Aichi targets, of  
98 which number 11 clearly states that protected areas should be "effectively and equitably  
99 managed", meaning that planning and management of MPAs needs to incorporate these  
100 human dimensions (UNEP 2010).

101

102 An appreciation is needed of how stakeholders, whose support is required to achieve MPA  
103 conservation goals, measure success and how that varies between stakeholder groups.

104 Whilst the different perceptions of MPA success among stakeholder groups have received

105 some consideration (Himes, 2007), as yet unexplored is whether stakeholders' understanding  
106 of the purpose of an MPA aligns with how they would measure its performance. It has been  
107 argued that for MPAs to be successful, all stakeholders must be aware of and agree on MPA  
108 goals and expectations (Abecasis et al., 2013; Himes, 2007). Understanding the extent to  
109 which stakeholder views of success align with an MPA's stated goals will indicate the level of  
110 congruence between governance institutions and local stakeholders. This understanding can  
111 be useful for community engagement activities designed to build support for the MPA, as  
112 well as for developing monitoring programs that capture aspects of importance to  
113 stakeholders. Exploring how a group of stakeholders view both an MPA's purpose and its  
114 successful performance can also provide insight into the role education/awareness raising  
115 (i.e. creating understanding) of purpose can have on shaping expectations of performance.  
116 Ultimately, understanding how stakeholders perceive success should feed into the  
117 development of MPA designation plans and management strategies to maximise the  
118 potential realisation of multiple success types and thus more equitable experience of MPA  
119 success across stakeholders.

120

121 Here we explore MPA success with a diverse group of stakeholders adjacent to a recently  
122 established MPA in South Australia. We consider how different stakeholder groups: 1)  
123 perceive the purpose of the MPA, 2) how this perceived purpose compares to what measures  
124 stakeholders would choose to judge the success of the MPA, 3) which specific indicators  
125 stakeholders suggest could be used to measure the success of the MPA, and 4) how  
126 stakeholders think the success of the MPA could be enhanced in the future.

127

## 128 **1.1 Study site**

129

130 South Australia has 19 multiple use marine parks designed to protect and conserve marine  
131 biological diversity and marine habitats, as designated under the South Australian Marine  
132 Parks Act 2007 (South Australian Government, 2007). Together these parks form the South  
133 Australian Representative System of Marine Protected Areas (DEH, 2004), and encompass  
134 the major ecosystems and habitat types found in South Australian waters. Each park  
135 comprises a series of 'use' zones graded from general use through to highly restricted 'no go'  
136 sanctuary zones (DEWNR, 2012b). The State's lead environmental agency, the Department of

137 Environment Water and Natural Resources (DEWNR), led the process of park implementation  
138 and now has oversight of park management (DEWNR, 2012a).

139

140 Achieving the 19 MPAs for South Australia was a long and protracted journey taking 14 years  
141 and traversing a highly politicised process. Kirkman and Shepherd (2015) give an overview of  
142 the opposition, strategies and strength mustered to resist the designation and formalisation  
143 of marine parks led primarily by a powerful fishing lobby. The process commenced in 1998  
144 with the South Australian state government committing to a representative system of Marine  
145 Protected Areas within five years (South Australian Government, 1998). In 2001 the 2003  
146 target was extended by four years in a revised vision statement {Government of South  
147 Australia, 2001 #264}. In 2004 the Blueprint for the South Australian Representative System  
148 of Marine Protected Areas heralded an establishment date of 2010 (DEH, 2004). The state's  
149 strategic plans of 2007 and 2011 both refer to the importance of and implementation of the  
150 marine parks. Between 2008 and 2012 extensive work was undertaken (scientific studies,  
151 planning and design) to deliver the parks. Comprehensive efforts to engage the public ran in  
152 parallel with the research and design. In 2012 the parks were finally approved. However, as a  
153 result of political and sectoral wrangling the original vision and design principles of  
154 comprehensive, adequate and representative (CAR) coverage of habitat types across the  
155 state waters was heavily compromised in the final 2012 result (Kirkman and Shepherd 2015).

156

157 The Encounter Marine Park was the first of the South Australian marine parks to be piloted  
158 under the multiple-use system. It encompasses the waters off southern metropolitan  
159 Adelaide and the Fleurieu Peninsula, covering an area of 3,119 km<sup>2</sup> (Fig. 1). The Encounter  
160 Marine Park pilot process commenced in 2002, with a draft zoning plan released after public  
161 consultation in 2005. The outer boundaries of the Encounter Marine Park were formally  
162 proclaimed in 2009 after further consultation with key stakeholders. Marine park local  
163 advisory groups, comprised of regional stakeholders and representatives, were established  
164 that same year to provide input into the management planning process, with the current  
165 Encounter Marine Park zones and associated management plans implemented in 2012  
166 (Kirkman, 2013).

167

168 The Encounter Marine Park is adjacent to Kangaroo Island and the southern Fleurieu  
169 Peninsula region (comprising the Local Government Associations of Victor Harbor, Yankalilla  
170 and Alexandrina). This region has traditionally been a holiday and retirement destination but  
171 more recently there has been much faster population growth than that of metropolitan  
172 Adelaide (ABS, 2015). Fishing, both commercial (aquaculture and wild catch) and recreational  
173 are significant to the region's economy. Key target species include southern rock lobster,  
174 black lip and green lip abalone, western king prawn, sardines, snapper, King George whiting,  
175 southern garfish, southern calamari and blue swimmer crab. A number of commercial and  
176 recreational fishing practices are used including netting (trawl, gill or mesh, hauling and dab  
177 nets), line fishing (rods and lines, hand lines, longlines and droplines), traps and pots and  
178 hand held implements (rakes, nets) (PIRSA, 2015).

179

## 180 **2. Methods**

181

182 We engaged stakeholders in either individual, semi-structured interviews or focus groups. In  
183 many ways, focus groups and in-depth interviews are very similar and can be equally  
184 effective in answering certain research questions (Crabtree, Yanoshik et al. 1993). Both  
185 interviews and focus groups draw upon participants' attitudes, beliefs, and experiences  
186 (Morgan and Krueger 1993). We chose to use a combination to reflect the context of the  
187 groups we targeted and to maximise participation with the available resources we had.

188

189 One-to-one interviews allowed for detailed, in-depth and controlled questioning. Our  
190 interviews focused on individuals who held a professional role in the designation and/or  
191 ongoing management of the MPA. We interviewed them during the day, as part of their job.  
192 These individuals were not necessarily geographically clustered and challenges of co-  
193 ordination across multi-organisations and work schedules made bringing them together in  
194 focus groups less feasible. We also anticipated they would provide substantial detail,  
195 requiring more individual time, and that they may have been more constrained in the  
196 information they felt they could provide if they have been in a (unavoidably) mixed-  
197 institution focus group.

198

199 Interviews took between 40 minutes to one hour and were recorded using a digital voice  
200 recorder for later transcription. During the interview process additional potential participants  
201 were identified. Where appropriate, these potential participants were contacted via email  
202 and/or phone and invited to participate (snowball sampling). Forty-one face-to-face  
203 interviews were conducted between April and November 2015.

204

205 Four focus groups of between 7 and 9 people were held between September and October  
206 2015 at three regional centres adjacent to the Encounter Marine Park. These focus groups  
207 targeted input from the broader community of residents and resource users. Focus groups  
208 allowed us to enable more individuals to participate than if we had only conducted  
209 interviews, both because multiple individuals were participating at the same time and  
210 because community groups were clustered in regional locations so logistically it was more  
211 efficient to bring them together as groups. We grouped likeminded participants together  
212 (conservation and commercial groupings) within focus groups because groups that consist of  
213 individuals that share many of their feelings and experiences provided a more comfortable  
214 space for participants to share their views (Morgan and Kreuger, 1993). Indeed several of our  
215 focus group attendees said they wouldn't have been comfortable doing an individual  
216 interview, but that they were amenable to contributing as part of a group.

217

218 Two of the research team moderated each focus group. One facilitated the group discussion  
219 introducing the general issues and asking questions, allowing some flexibility in discussion,  
220 and probing or interjecting to keep the conversation focussed. The second scribed key  
221 emergent ideas on a screen for the group to track the discussion and managed the digital  
222 recorder. While there was some latitude for free discussion of issues the moderator brought  
223 the discussion back to the question set to allow for comparison on the guideline questions  
224 across groups (see Supplementary Materials).

225

226 Selection of participants was non-random; we targeted individuals that had a record of  
227 involvement in the MPA and we aimed to canvass views from a range of different  
228 perspectives, including commercial and recreational sectors, conservation and volunteer  
229 groups, park management, and local and state government representatives. Participants  
230 were selected using a range of strategies. Park management staff and local government

231 officials known to the researchers were approached. Sectoral, peak body (an advocacy group  
232 or trade association) and conservation NGO leaders or representatives were identified via  
233 internet searches, as were local volunteer and interest group networks. These groups were  
234 sent an email or letter of invitation explaining the goals of the project. A non-response was  
235 followed up by a phone call. Advertisements for the focus groups were placed in shop  
236 windows (including tackle shops, convenience stores, and tour operators) and on notice  
237 boards at shopping centres and libraries in the regional centres surrounding the Encounter  
238 Marine Park. An advertisement was also placed in a local newspaper. At our request,  
239 representatives of regional councils, conservation, volunteer and sectoral organisations sent  
240 an email invitation to their mailing lists. To boost attendance, individuals who expressed a  
241 wish to attend the focus group were requested to circulate an invitation to others in their  
242 immediate network.

243

244 During both interview and focus group sessions participants were asked a series of open-  
245 ended questions on the same subject matter. Questions initially explored participants'  
246 knowledge of the Marine Park and their understanding of its purpose, then participant(s)  
247 were asked as to their perception of benefits and costs (realised or potential) of the Marine  
248 Park, whether they believed the Marine Park to be a success and what indicators they might  
249 use to measure success (see Supplementary Materials 1 for list of questions). Responses  
250 were recorded using a digital voice recorder.

251

252 The interviews and focus group discussions were transcribed to a Word document and later  
253 uploaded to NVivo. A thematic analysis was undertaken following inductive mapping, where  
254 coding and themes were directed by the content of the data. We used a 'scissor and sort'  
255 technique by going through the transcript and identifying those sections of it that were  
256 relevant to the research question (Stewart *et al.* 2007). The analysis followed a series of  
257 processes, with some back-and-forth movement between them. Researchers first  
258 familiarised themselves with the content of the transcripts. A coding frame was designed to  
259 capture important features of the data and to respond to the research objectives. The data  
260 set was then organised into codes. The codes were then read for patterns and emerging  
261 themes. Qualitative responses were coded according to their content into a range of broad  
262 nodes based on interview questions; perceptions of success, split into three broad



263 categories: biological (e.g., biodiversity, habitat protection, species abundance), social (e.g.,  
264 community engagement, education) and economic (e.g., tourism, fisheries); and measures  
265 of success. Where directional measures of success were provided (e.g., increased  
266 abundance of fish, decreased number of boat strikes on megafauna reported), these were  
267 transformed into non-directional indicators. The number of individuals responding to  
268 specific themes was recorded (after Stewart *et al.* 2007).

269

270 Ethics clearance was obtained from the Flinders University Social and Behavioural Research  
271 Ethics Committee on 9 April 2015. All respondents were provided with participant  
272 information documents before they decided if they wanted to participate, and all signed  
273 consent forms prior to the interview/focus group taking place.

274

### 275 **3. Results**

276

277 Altogether, 73 people participated in the study. This consisted of 41 respondents interviewed  
278 individually (Table 1) and 32 respondents who took part in one of four focus groups (Table 2).  
279 Of those 73 individuals representation was evenly distributed across three stakeholder  
280 groups: government (state and local) (n=24), conservation and community groups (n=26),  
281 and fisheries (commercial and recreational) (n=22). All participants had been involved, either  
282 directly or indirectly, with the marine park. Engagement included: participating in the initial  
283 planning process (including commenting on draft plans; acting on a local advisory group, or  
284 the state-wide steering committee); conducting citizen science projects or educational  
285 activities; using resources (e.g. commercial and recreational fishing and other recreation  
286 activities); campaigning/advocacy; undertaking ongoing monitoring and management.

287

#### 288 **3.1 Understanding the purpose of the Encounter Marine Park**

289

290 When asked to describe the purpose of the Encounter Marine Park, all 41 interviewees and all  
291 focus groups provided a biological conservation as the primary purpose (Fig. 2). The majority  
292 of interviewees (59%, n=24) and all focus groups specifically identified habitat protection.  
293 Many other respondents referred to the protection of breeding grounds (without specifying  
294 for fish).

295

296 *The marine park is basically to protect the habitat of the animals that are in there, so the*  
297 *flora and fauna... to actually protect certain areas and samples of the habitat types that*  
298 *actually exist in our waters. Within that there are sanctuary zones for very specialised*  
299 *places as samples of those habitats types that are actually set aside for species*  
300 *conservation purposes. [ID 16 Environment NGOs and community groups]*

301 *...to provide protection for biodiversity in particular, and also to provide a level of*  
302 *protection to the marine environment and ecology from perceived or real threats. And*  
303 *also, the line that they trot out is also to preserve pristine habitats from potential future*  
304 *degradation or exploitation. [ID 32 Fishing—commercial and recreational]*

305 *Protection of species. I would regard that not just related to fish and the like, but also*  
306 *seaweeds and anything that's growing in the area, which is being degraded [...]. [Focus*  
307 *Groups B (Conservation interests)—Victor Harbor]*

308

309 There was also emphasis placed on the conservation of fish or fish stocks, with five  
310 interviewees (12%) and one focus group specifically stating the protection of fish as a  
311 purpose of the park.

312

313 *To prevent overfishing and restore the fish population, which has become degraded over*  
314 *the years because of more and more people taking fish out, either as amateurs or*  
315 *commercial fishing. [ID 15 Environment NGOs and community groups]*

316

317 One fifth of all interviewees (n=9; 22%) and two focus groups also identified social and/or  
318 economic purposes for the marine park. Stated socio-economic purposes or 'community  
319 benefits' included primarily education, recreation and tourism. Of note, these were often  
320 referred to as a secondary or added purpose.

321

322 *Primarily a conservation asset, so looking to set aside some of our healthier areas for*  
323 *long-term conservation benefit, that's our primary objective. The secondary*  
324 *aspirations really are around ensuring people get to enjoy, understand and use the*  
325 *Marine Park sustainably. [ID 3 State Government—Environment]*

326 *It's about keeping what's there (wildlife) and encouraging more. Looking after wildlife,*  
327 *basically. It's really an educational campaign as well; I think there's two parts to it. It's*  
328 *the saving and the learning! [ID 37 Local Government]*

329 *Primarily that marine parks are there to conserve all parts of marine biodiversity in*  
330 *that part of the bioregion they're in... There's a whole range of other purposes... if we*  
331 *can encourage some good, well thought through marine nature-based tourism*  
332 *opportunities and stimulate those [local] economies. [ID 6 State Government—*  
333 *Environment]]*

334 Participants stated understanding of the purpose of the Marine Park correspond tightly to  
335 the official purpose outlined in the Marine Parks Act (South Australian Government, 2007)  
336 which highlights the objects of the Act are to:

337 *“to protect and conserve marine biological diversity and marine habitats by declaring*  
338 *and providing for the management of a comprehensive, adequate and representative*  
339 *system of marine parks”*

340 And to assist in:

341 *“(i) the maintenance of ecological processes in the marine environment;*  
342 *(ii) the adaptation to the impacts of climate change in the marine environment;*  
343 *(iii) protecting and conserving features of natural or cultural heritage significance;*  
344 *(iv) allowing ecologically sustainable development and use of marine environments;*  
345 *(v) providing opportunities for public appreciation, education, understanding and*  
346 *enjoyment of marine environments.”*  
347

348 Thus participants demonstrated that they had a very good understanding of the goals of the  
349 MPA, with its primary focus on biological conservation and additional aspects of ecological  
350 sustainability and public appreciation.

351

### 352 **3.2 Opinions about the marine park's success**

353

354 When asked if the Encounter Marine Park has been a success, multiple aspects of success  
355 across a biological, social and economic spectrum were generated. Responses demonstrate  
356 that stakeholders have a range of interpretations of what success is, with different  
357 respondents focusing on different aspects they believe to have been or not been successful.  
358 Responses also highlighted that success types could occur or accumulate over different  
359 timescales.

360

361 Indeed, many people suggested that it was too early to tell (n=24 interviewees, 59%, all focus  
362 groups) if the marine park had been a success. Several of those that said it was ‘too early’ to  
363 tell made specific reference to biological successes and the need to await monitoring results.

364 *It’s years down the track, I think it’s too early [...]. [DEWNR] are still setting up their*  
365 *monitoring programs [to gather] baseline data collection inside and outside sanctuary*  
366 *zones. [Focus Group C Conservation interests—KI]*

367 *I think it’s impossible to assess in the absence of constructive feedback from the*  
368 *monitoring, evaluation and reporting program. You can’t make a call, because I don’t*  
369 *know of the data, what data’s being collected, what were the baselines, what’s*  
370 *changed over time, some impacts are not going to be realised for 10, 15, 20 years. So I*  
371 *think that’s an impossible [call]. It’s going to take a long time for the data to be*  
372 *collected. [ID 17 Environment NGOs and community groups]*

373 Many other respondents thought the park was already successful, at least certain aspects,  
374 (17 interviewees, 41%, and 2 focus groups). However, they focused on non-biological  
375 measures of success. Eleven interviewees (27%) and two focus groups (one conservation, one  
376 fisheries) suggested that the existence of the Encounter Marine Park was, in its own right, a  
377 success. Eight interviewees (20%) reported that it was a success because it had raised  
378 awareness of the marine environment and the need to conserve it.

379 *I would think in the main, the concept of marine parks has been successful.... we’re*  
380 *now talking about something we weren’t talking about before, so I think all the*  
381 *promotion and education around them has been very successful. [ID 40 Local*  
382 *Government]*

383 *The presence of the marine park has started to open peoples’ eyes, their perspectives have*  
384 *changed... [ID 21 State Government—Environment]*

385

386 Some respondents discussed an increased pride of place (n=5 interviewees) and two  
387 individuals provided specific examples of how the designation of the Encounter Marine  
388 Park already has affected the perceived value of the region.

389 *I know that one of the bus drivers who take bus tours around the island have said that,*  
390 *they've always stopped at Pelican Lagoon to show people the scenery [...], and*  
391 *occasionally people get out the bus and take a photo. Whereas now he stops at the*  
392 *same place and says, 'this is now a marine park sanctuary zone' and everyone gets out*  
393 *the bus to take a photo of it, just because it's a sanctuary zone. [ID 35 State*  
394 *Government—Environment]*

395 *As a success already, I work at Seal Bay Conservation Park [...]. We talk about the*  
396 *marine park and all that sort of stuff. There is nothing but positive feedback about*  
397 *having the marine park. [Visitors] just go off with great big smiles [Focus Group C*  
398 *Conservation interests—KI]*

399  
400  
401

402 There was also evidence of community support for the Encounter Marine Park and the  
403 waning of negative 'noise' about it since implementation was offered as an indication of  
404 success s by eight interviewees (20%) and one focus group.

405 *I think it has been a success since it started, but when it was proposed it wasn't. Since it*  
406 *became official... I've definitely had almost no one coming in to complain about them, I*  
407 *can't think of a single complaint coming through the council once they were in place, and*  
408 *at council everyone comes in to complain...! You rarely hear when something's good. [ID 8*  
409 *State Government—Environment]*

410 MPA planning processes invariably involve some compromises, and these compromises can  
411 leave some stakeholders dissatisfied with the result. Here, it was the opinion of roughly one  
412 quarter of interviewees (n =10, 24%) and two focus groups that the Encounter Marine Park  
413 was not a success because of inadequate sizing/zoning within the park and some (n= 6) linked  
414 this directly to socio-economic and political pressures.

415 *I'm not sure that we were completely successful in securing a zoning plan that will provide*  
416 *adequately for all the biodiversity conservation needs of the Encounter Marine Park, and*  
417 *a lot of the other marine parks, into the future. In other words I don't think we got the*  
418 *optimal zoning plan this time around, on this pass. [ID 6 State Government—*  
419 *Environment]*

420 *“...in practical terms a lot of these sanctuary zones may actually be too small to have*  
421 *ecological benefits, through too much compromise in the past. And that’s just purely*  
422 *looking from an ecological perspective, and of course there have been a lot of social,*  
423 *political, economic pressures to make that happen, that they are actually fairly small.” [ID*  
424 *26 State Government—Environment]*

425  
426 *“...but [current sanctuary zones] are not representative. The areas you needed should*  
427 *have been close to the shore of the mainland, but these were too political so they didn’t*  
428 *go through.” [ID 20—commercial and recreational]*

429  
430  
431 Thus whilst respondents suggest, in concurrence with scientific evidence, that it will take a  
432 number of years to know if the MPA has been a success in terms of as delivering the  
433 biological goals, they provide lots of evidence of it already achieving some ‘social’ success.  
434 Maintaining the MPA long enough to enable the accrual of biological success will arguably be  
435 down to ongoing social success and local politics. Thus, identifying, understanding, enhancing  
436 and capitalising on these social success is an important aspect of MPA management.

437

438

### 439 **3.3 Measuring success**

440

441 When asked how they would measure the success of the marine park, the focus was again  
442 much broader than biological conservation. Respondents provided a range of measures,  
443 which we placed into three broad categories: biological, social, economic, see Table 4 for a  
444 selection, and Supplementary Materials, Table 1 for a full list. Biological (n=37 interviewees,  
445 three focus groups) and social measures (n=36 interviewees, all focus groups) were the most  
446 commonly provided, though economic measures were still suggested by over half of the  
447 interviewees (n=21) and all focus groups (Table 3, Fig. 2). Most of the time interviewees and  
448 focus groups provided both biological and social or economic measures of success (n=34  
449 interviewees, 88%; and three focus groups). Overall, social or economic measures of success  
450 were provided by slightly more respondents than biological ones: 39 interviewees (95%) and  
451 all four focus groups provided at least one social or economic measure of success compared  
452 to 37 interviewees (90%) and 3 focus groups providing at least one biological one. Four

453 interviewees and one focus group provided exclusively social or economic measures of  
454 success, compared to just one interviewee that offered only biological measures.

455

456 That social, and to a lesser extent economic, measures of success were so frequently  
457 mentioned, indeed slightly more often than biological measures, is at apparent odds with the  
458 respondents stated understanding of the goals of Marine Park, which was primarily biological  
459 conservation. This disparity appears even greater when the specific measures are considered:  
460 there were a total of 64 separate measures of success provided, including 8 biological, 19  
461 economic, 28 social and 9 social-economic measures. The much larger diversity of social,  
462 economic and socio-economic measures may reflect the complexities of socio-economic  
463 success, but it may also represent respondent's greater understanding of the socio-economic  
464 context, in which they are immersed, than the more removed biological one.

465

466 When suggesting measures, many respondents provided a particular direction by which they  
467 would determine success or failure (e.g., increased abundance of fish versus decreased  
468 abundance or no change over time). Because the direction by which success is measured has  
469 the potential to vary by stakeholder group or by individual, listed measures are provided as  
470 non-directional (Table 4 and Table S1, Supplementary Materials; see Discussion section 4.2).

471

472 Suggested biological measures of success included: number of species present, size and  
473 abundance of fish, and degree of habitat damage.

474

475 *Sea grasses coming back, more fish coming back in, more marine life – coming back to*  
476 *what it was, I guess. Has it improved under the water since it's been implemented? I don't*  
477 *know. So [an increase in the extent] of sea grasses. With [the sea grasses] there it would*  
478 *attract the marine life back in again: everything that lives out in the sea... It's not just fish,*  
479 *I suppose the quickest measurement is the numbers of the fish stock overall [inside and*  
480 *outside the marine park]. [ID 24 Local Government]*

481

482 *...whether species increased or habitat improved, stuff like that, and you may compare it*  
483 *to similar places that aren't protected. [ID 38 State Government—Environment]*

484

485 *To be able to demonstrate that we've preserved or protected or done something to*  
486 *conserve biodiversity, we have to measure some biophysical parameters of marine parks,*  
487 *so some measure of how well they're doing with respect to the biodiversity that occurs*  
488 *there, and the conditions of the environment that occurs there. [ID 21 State*  
489 *Government—Environment]*

490

491 Suggested social measures of success included: levels of community support expressed for  
492 the marine park, levels of restrictions on activities considered harmful to conservation  
493 objectives, levels of voluntary compliance/violation of rules, levels of stewardship and  
494 community involvement in park management, amount of positive commentary about the  
495 park in the media, and level of incorporation of the marine parks into local school curriculum.

496

497 *That's another way to measure success, and of course the other thing is, to measure*  
498 *community buy-in: does the community support the marine parks, and does the active*  
499 *community support the marine parks? [ID 19 Fishing interests—commercial and*  
500 *recreational]*

501 *Compliance is an issue I think [...]; compliance would be a good indicator [of success].*  
502 *[Focus Group C (Conservation Interests)—K1]*

503 *Looking at the community involvement, so number of volunteers, even vandalism to*  
504 *signs... [ID 3 State Government—Environment]*

505 Suggested economic measures of success included: quantity of catch (fisheries), change in  
506 tourism activity, value of real-estate adjacent to the park, development of new businesses,  
507 revenue of existing businesses.

508

509 *Economically, if commercial fishing [is able] to continue into the future, that would be*  
510 *good; that would be the proof of the pudding. There should be a flow from marine*  
511 *parks into the fishing areas. [ID 27 NGO and community groups]*

512 *Tourism – the number of tourists could be a measure, and the number of residents,*  
513 *but how do you know if migration is due to the marine park? [ID 20 Fishing interests—*  
514 *commercial and recreational]*



515 *If you look at interstate examples where there's been marine parks in place for some*  
516 *time, you'll start to see – even in real estate ads – 'great house next to a marine park'.*  
517 *You know you've got a measure of success when someone's using it as an asset in a*  
518 *real estate sale. [ID 35 State Government—Environment]*

519 *The next thing to look at would be economic, and I think the measure of that would be*  
520 *seeing allied industries or business areas grow, or at least not decline. I think the difficulty*  
521 *with that is because there are such fine linkages between what a marine park means and*  
522 *how that actually connects to the business of a hardware and fishing tackle store, or a*  
523 *fish and chip shop or even the fuel station, makes it very difficult. [ID 28 Local*  
524 *Government]*

525 As well as highlighting that respondents considered a much greater variety of success  
526 measures than biological, responses also demonstrate an understanding of the fact that  
527 measuring or demonstrating some these successes, or lack of them, will be very challenging.

528

529

### 530 **3.4 Weighting of measures**

531

532 Not all successes are equal and knowing which ones are more valuable to stakeholders can  
533 help guide discussion and inform the inevitable trade-offs when planning and managing  
534 MPAs. When asked to identify the most important measurement criteria to gauge success of  
535 the Park, nearly one quarter of our interviewees (n=10; 24%) explained that the  
536 environmental (biological/ecological) criteria were on a 'level playing field' with socio-  
537 economic. They could not differentiate a weighting between them as they believed the  
538 criteria were interconnected, highlighting the need realise one success type to support  
539 achievement of another.

540

541 *It's a hard one, as they're so interlinked. As a scientist I'm of course inclined to say the*  
542 *ecological thing is important, but of course you can't have ecological outcomes without*  
543 *support from the community and general public. [ID 26 State Government—Environment]*

544 *I would put them all equally. All of them have a different outcome, a different reason for*  
545 *needing that data. [ID 31 Local Government]*

546 *It's really tricky because they're so intertwined. Without the ecological outcomes it will*  
547 *be harder to garner the community support, and without community support you're*  
548 *going to have compliance issues, which can undermine ecological outcomes. [ID 13 Local*  
549 *Government]*

550  
551  
552 Nine interviewees (22%) said that while they would select environmental  
553 (biological/ecological) measures as the most important, they also recognised the substantial  
554 importance of socio-economic measures.

555 *It comes back to the purpose [of the park]... [Top ranked would be] the number of species*  
556 *identified as significant, are they still there, and are those habitats still functioning as they*  
557 *were found? Then it'd be the social. [ID 17 NGO and community groups]*

558 *Number one has to be – because we can't measure the success of the parks without this –*  
559 *number one has to be some biophysical measure of the trends of protecting biodiversity.*  
560 *However, I wouldn't put it so far ahead that we exclude doing anything else. So then*  
561 *equal to that I think we need those measures of social, economic and even cultural*  
562 *change, and I'd rank those equally around trying to understand how the community's*  
563 *tracking and where it wants to go. [ID 21 State Government—Environment]*

564 Five interviewees (12%) argued that the socio-economic success measures were the most  
565 important because of the wider implication that they have.

566 *Socio-economic is the most important. That's because of the politics.... We need to be*  
567 *able to demonstrate very quickly that this has had a neutral impact [ID 3 State*  
568 *Government—Environment]*

569 .....if we don't have that second bit, the fact that people appreciate it and understand  
570 it, then they're not going to protect things for very long because we'll get rid of them.  
571 So I suppose to make sure that they are there, we need to concentrate on the social bit,  
572 even if that may not technically be the most important thing. The political side of things  
573 is [therefore] probably more important than the environmental side of things. [ID25  
574 State Government—Environment]

575  
576  
577 Thus, while our respondents universally acknowledge the primary purpose of the Marine Park  
578 to be biological, they certainly do not universally think that biological success is the most

579 important. Rather respondents repeatedly identified an appreciation of the need to achieve  
580 social success in order to obtain biological success, and the importance of politics in doing so.

581

582

### 583 3.5 How to increase the success of the MPA

584

585 All suggestions of increasing the future success of the MPA related to social and economic  
586 aspects of the Encounter Marine Park and suggest an inherent understanding that success of  
587 all types requires socio-economic investment. Many interviewees and all three focus groups  
588 identified interwoven aspects of enhanced communication, education, awareness raising,  
589 and community engagement/outreach and as being central to improving the success of the  
590 MPA. Communication, in particular, was considered essential for effectively engaging the  
591 community and improving stakeholder buy-in. Our respondents discussed three main aspects  
592 of communication that need improving to increase the Marine Park's success: improving  
593 information outputs to publicise the Encounter Marine Park—to sell the concept of the  
594 marine park and to highlight successes; publicising management and monitoring program  
595 results because monitoring data is essential to promote the park's achievements; and the  
596 need for transparency and openness.

597 *And then also building in [the message], 'the marine environment's great, so we're*  
598 *protecting it'. That's something that's missing at the moment, a lot of the marine parks'*  
599 *information is purely about the rules, where you can and can't fish, and it's all about*  
600 *recreational fishing, it's not about 'these are the special things that are the reasons we've*  
601 *got these sanctuary zones here'. It needs to be about concentrating on what you can do,*  
602 *rather than what you can't. [ID 25 State Government—Environment]*

603 *Just more publicity, more awareness, more signage, and more monitoring [...]; monitoring*  
604 *so the results do become known. I think the impacts [of activities] need to be monitored,*  
605 *and we'd like to hear the results of that as well. [ID 27 Environment NGOs and community*  
606 *groups]*

607

608 *... highlighting successes; highlighting community buy-in, highlighting stakeholder*  
609 *engagement... [ID 16 Environment NGOs and community groups]*

610

611 *I'd like to know what the monitoring regime [is]. I think the monitoring regime should be*  
612 *on a public website so that people of any level of interest can have access to the*  
613 *information... It may be a failure, but let's be open about that and let's have a look at that*  
614 *information. [ID 18 Local Government]*

615

616 Discussions around education involved both the more formal, traditional education routes,  
617 such as working directly with schools, and more general awareness raising through  
618 community engagement and outreach.

619

620 *I've always been a big one for educating the young people, so getting into schools and*  
621 *setting up a proper marine education program that addresses the needs for teachers to*  
622 *teach about marine life in South Australia... [ID 10 Environment NGOs and community*  
623 *groups]*

624

625 *I think we need to be better at communicating the things we are trying to conserve and*  
626 *why... working with the community, so they are part of the monitoring and the*  
627 *management. [ID 22 State Government—Environment]*

628

629 Multiple respondents (n=8 interviewees, 20%; and 2 Focus Groups) acknowledged that in the  
630 end everything comes back to money. Regional economic development within communities  
631 attributable to the marine park (such as tourism ventures or eco-labelling of food products)  
632 were felt would help engender support for the Encounter Marine Park. In addition, it was  
633 considered that adequate resourcing will be essential to sustain management functions of  
634 the Encounter Marine Park.

635

636 *I don't think there's enough discussion of what are the commercial opportunities that will*  
637 *ultimately contribute to sustainable resource use... I'm thinking of the tourism side of*  
638 *things, I'm not talking about commercial fishing... In the marine park you do need to*  
639 *seriously look at what are the commercial tourism opportunities, both to start the process*  
640 *of seeing another value of the park. [ID 17 Environment NGOs and community groups]*

641

642 *Funding, everything hinges on funding; whether we look at stewardship, or compliance or*  
643 *the monitoring side, all of that needs to be kept up or increased and that requires*  
644 *funding. [ID 26 State Government—Environment]*

645

646 *If there were more resources available you could do more from a compliance point of*  
647 *view, you could do more from an education point of view: you could put on more activities*  
648 *for kids, you could put in more interpretive signs if that's what you decided you needed.*

649 *But everything is now limited by resources. [ID 35 State Government—Environment]*

650

651 That respondents provided only socio-economic means to increase future success of the park  
652 reflects the reality that MPAs are social constructs that need social, political, and economic  
653 support to be successful. Results demonstrate the importance of the human dimensions, the  
654 need to raise awareness so that people will value the Marine Park and in turn galvanise  
655 enough political support to ensure sufficient and ongoing funding for education, monitoring  
656 and compliance. The link to politics for the success of the park, both past (including original  
657 designation) and ongoing is inferred multiple times (n=13 interviewees and all focus groups)

658

659 *...in my cynical moments I wonder how much it was partly a political choice to have a park*  
660 *there simply because of its proximity to Adelaide, and there's a lot of people on the*  
661 *Fleurieu too. [ID 1 Environment NGOs and community groups]*

662

663 *...from a management point of view, if your political leaders see your program as that*  
664 *fantastic then they're likely to keep funding it into the future. [ID 3]*

665

666 *If we have a political environment that is regressive with marine parks with respect to*  
667 *marine parks, then I think that it could go pear-shaped pretty quickly. If the current*  
668 *political environment prevails then I think the future looks good. [ID 6 State Government—*  
669 *Environment]]*

670

671 *The 10-year review will be challenge if the political animosity has not been resolved... if*  
672 *you had bipartisan support from both the major parties, that would just make things so*  
673 *much easier... [ID 13 Local Government]*

674

675

676

## 677 4. Discussion

678

679 This study examined MPA success, using the Encounter Marine Park in South Australia  
680 established in 2009. Through semi-structured interviews and focus groups with 73  
681 respondents from three main stakeholder groups, we found that stakeholder understanding  
682 of the purpose of a park differs from how they would measure its successful performance.  
683 We found that stakeholders consider that social and economic aspects of MPAs to be as  
684 important for current success as biological aspects. Moreover, stakeholders were united in  
685 expressing that future success of the MPA depends on social and economic aspects, and they  
686 highlighted the role of politics in determining success.

687

### 688 4.1 Perceptions of purpose versus perceptions of performance

689

690 Success is a complex, multifaceted concept, which very much depends on an individual's  
691 perspective. In the literature, MPAs, in general, are considered successful when they are seen  
692 to have achieved/be achieving their purpose (i.e., their stated aims and objectives) (Pollnac et  
693 al., 2001; Pomeroy et al., 2005). All of the respondents in this study (interviewees and focus  
694 group participants) identified the purpose of the Encounter Marine Park to be biological. Only  
695 around one quarter of respondents also provided secondary social or economic purposes.  
696 However, when asked how they would measure the Park's success, only one respondent  
697 provided exclusively biological measures. All other respondents, both interviewees and focus  
698 group participants, specified social and or economic measures of success, exclusively or in  
699 addition to biological measures. Stakeholders identifying social and economic measures of  
700 success is, in itself, unremarkable. That MPAs can have substantial social and economic  
701 implications, both positive (Alder et al., 2002) and negative (Mayo-Ramsay, 2014; Yates and  
702 Schoeman, 2015), is well established. What is interesting, and important, is that whilst our  
703 respondents clearly identified the primary purpose of the designation of the park as  
704 biological conservation, they would measure if the MPA was successful based on social and  
705 economic effects as readily as the biological ones. For some respondents these economic and  
706 social measure of success were more important than the ecological ones, despite the  
707 ecological measures relating directly to the goals of the MPA. Thus, it seems that what

708 stakeholders consider 'success' may not always be related to the purpose the MPA was  
709 designated for, even when stakeholders have been educated as to what that purpose is.

710

#### 711 **4.2 Measuring success**

712

713 Quantifiable measures (indicators) are an essential aspect of effective monitoring programs,  
714 enabling us to assess if MPAs have achieved their objectives. While the literature on  
715 ecological and biophysical indicators is extensive, the literature on social and economic  
716 indicators has lagged behind and is generally less well developed (Pomeroy et al. 2006). 'Best  
717 practice' guidelines exist for socio-economic indicators, which are intended for general use  
718 and are presented as broad guidance regarding the development of such indicators (e.g.,  
719 Bunce et al. 2000, Hockings et al. 2006, but see Pomeroy et al. 2004). In contrast to these  
720 broad guidelines, respondents here were often quite specific when suggesting indicators of  
721 success.

722

723 Biological measures of success suggested by respondents corresponded closely to standard  
724 indicators published in the literature and already commonly used in MPA monitoring (e.g.  
725 species abundance, species richness). However, many of the respondent-proposed social and  
726 economic measures were novel and innovative, with most of the suggested measures not  
727 previously published (Table 4, Table S1). Suggestions ranged from measures that could be  
728 implemented and monitored relatively easily and with little cost (e.g., the extent of  
729 educational signage around the marine park, amount of funding allocated for marine park  
730 management), to measures that would be more challenging and costly to obtain (e.g., levels  
731 of misinformation transmitted by local media over time). Incorporating stakeholder-derived  
732 indicators into monitoring programs enables the collection and communication of  
733 information that directly relates to aspects of success that stakeholders care about. As well as  
734 providing useful information on different aspects of success about which managers may not  
735 have thought, using stakeholder suggested measures of success acknowledges stakeholders  
736 views, makes the achievement of more equitable success more likely, and encourages buy-in  
737 and future support.

738

739 Indicators tend to be non-directional (e.g., neither decreasing or increasing over time),  
740 however, determining the direction of the measure for quantifying success is important in  
741 practice, as perceptions may differ from place to place and among stakeholders. For  
742 example, having increased 'levels of scrutiny faced by commercial development applicants  
743 within or adjacent to the MPA' would be considered a success by local conservation groups,  
744 but may not be considered a success by a state government department tasked with  
745 expanding rural development initiatives. The same could be said for coastal real estate or  
746 rental prices; increases in price might be considered a success by older generations, who are  
747 generally property owners, but not for younger residents who may subsequently be priced  
748 out of their local home-owners market.

749

750 The level of importance placed upon specific success measures may also vary by community  
751 or among stakeholders. The Encounter Marine Park is in a post-implementation,  
752 management and monitoring phase. Ideally this management and monitoring should take  
753 into account perspectives of different stakeholders and report back on the realised  
754 achievements of the park should incorporate how different groups perceive success. Results  
755 show that here, this will mean highlighting and enhancing the social and economic successes  
756 as much as the ecological. Moreover, this study shows that while the use of standard  
757 indicators may be appealing to resource-limited governments, tailoring indicators so they are  
758 relevant to local stakeholder groups and developing a broader suite of indicators may be  
759 needed to effectively capture the diversity of stakeholders' perceptions of success.

760

761 Stakeholder participation in MPA management has to be meaningful to be effective, with  
762 clear pathways to impact decisions (Yates, 2018). The co-development of indicators that truly  
763 represent the priorities of local stakeholders is one way of enabling meaningful participation,  
764 but it will only be achieved through detailed consultation with those stakeholders. While this  
765 may be costlier in the short-term, it also provides a number of benefits for management.  
766 Consulting stakeholders on how to measure the success of a MPA and incorporating their  
767 suggestions gives stakeholders a voice, encourages participation in management and, when  
768 the measures are used, demonstrates that stakeholder input is valued (Elliott et al., 2001;  
769 Lundquist and Granek, 2005; McCay and Jones, 2011) all of which should increase support for  
770 the MPA. Understanding stakeholder's perceptions of success also gives an insight into their



771 disparate expectations, which can inform management as to those expectations through  
772 targeted communication. Given how important community support is for achieving MPA  
773 goals (Bennett and Dearden, 2014; Bernstein et al., 2004; Charles and Wilson, 2009), we  
774 suggest ensuring sufficient resources are available to develop measures in conjunction with  
775 stakeholders and that incorporating suggestions into monitoring plans should be a priority.

776

### 777 **4.3 Variation among stakeholder groups**

778

779 Perceptions as to what constitutes MPA success vary by stakeholder group (Himes, 2007).  
780 Our findings here support other studies that have shown a divergence within communities  
781 between groups with resource extraction interests (e.g. fisheries) and groups who prioritise  
782 conservation (Pomeroy *et al.*, 2006, Carcamo et al. 2014). Here, stakeholders from the  
783 fishing industry were more likely to identify economic measures of success than conservation  
784 groups. This is no surprise. Fishers are the group most directly affected by the spatial  
785 restrictions of MPAs, which can both reduce their income and increase their costs (Yates,  
786 2014). Fishers, being directly financially dependent on access to marine resources are  
787 justifiably concerned about the economic implications of MPAs. For many stakeholders  
788 fostering sustainable use is the priority (Carcamo et al. 2014). Conservation focused  
789 stakeholders not directly dependent on access to marine areas for their livelihood can afford  
790 to prioritise the more expansive goals of biodiversity conservation and ecosystem resilience.  
791 Neither an economic or ecological priority is more 'correct', they simply reflect the context of  
792 a particular stakeholder. An important part of MPA planning and management is  
793 understanding and incorporating the priorities of different stakeholder groups, mitigating  
794 conflict where possible and meeting objectives at minimum cost (Pendred et al., 2016).  
795 Involving stakeholders can contribute to better decisions (Pendred et al., 2016) and reduce  
796 the cost of MPA planning solutions (Yates and Schoeman, 2015).

797

798 Whilst some priorities and measures of success vary between stakeholder groups, we also  
799 found substantial overlap. Members of the fishing community identified biological measures  
800 of success, conservation stakeholders identified economic and social measures, and  
801 government representatives had the broadest view of success (including measures from all  
802 categories). Identification of shared perspectives on success can be a means to resolve

803 conflict, as well as opening up opportunities for innovate solutions to conflict that may result  
804 in greater acceptance and meeting of MPA biological goals). Thus, understanding that  
805 stakeholders may identify measures of success over and above the purpose of the MPA and  
806 understanding how those measures of success vary between groups are essential when  
807 planning and managing an MPA. As is acknowledging, as our respondents did, that some  
808 successes, primarily biological, are at least partially dependent on achieving other types of  
809 success, primarily socio-economic and political.

810

811 Effectively communicating monitoring results back to stakeholders is essential to  
812 acknowledge and maximise appreciation of successes, as highlighted by respondents in this  
813 study. Communication is also important for highlighting where more work is needed to  
814 improve the success of the MPA and encouraging communities to contribute. Provision of  
815 information around compliance, success stories, and opportunities for engagement were  
816 specific aspects requested by our respondents. An absence of information dissemination  
817 leads to disquiet and uncertainty, and cynicism. Knowing how stakeholders perceive success  
818 will enable communication efforts to focus on aspects that matter most to stakeholders.

819

820 Of course, perceptions of success may change over time. It is therefore important to monitor  
821 community perception across all stages of MPA development (from implementation  
822 onwards). With this in mind it will be beneficial to return to the Encounter Marine Park  
823 communities in five and 10 years' time to reassess the perceptions of this group of people to  
824 see whether or not their perceptions have changed and what can be learned from that,  
825 including which have been the most robust socio-economic indicators of success.

826

827

## 828 **5. Conclusion**

829

830 What constitutes MPA success is dependent on individual perspectives and local context.  
831 Meeting stated objectives is obviously an important aspect of success, yet even where MPAs  
832 are designed to achieve one particular goal and that goal is effectively translated to members  
833 of the community, the community will likely judge MPA success across a range of different  
834 measures, including those that the MPA was not necessarily designed for. Achievement of

835 these different measures of success can be interdependent. Therefore, a broad range of  
836 measures of success need to be considered when designing an MPA and developing its  
837 monitoring program, including social and economic measures, even if the goal of the MPA is  
838 entirely biodiversity conservation. Ideally these measures (indicators) should be developed in  
839 conjunction with the stakeholder community.

840

841 Communication is the key to attain and maintain the support of communities adjacent to  
842 marine parks and thus is an essential aspect of future MPA success. Communication efforts  
843 should focus on the issues relevant to those local communities/stakeholder groups, including  
844 sharing monitoring results that capture stakeholder relevant indicators of success. Ideally this  
845 should be considered at the early stages of MPA designation to maximise the collection and  
846 dissemination of as many 'success stories' as possible, and to achieve early wins and local  
847 buy-in.

848

849 In the end, there are no short cuts when it comes to gaining broad stakeholder buy-in for an  
850 MPA. Investment in understanding and incorporating stakeholders throughout planning and  
851 management phases is essential, and part of that should involve gathering different  
852 stakeholder's perceptions of success. Success (or failure) will consist of a multitude of  
853 aspects, many of which will be less tangible and thus more difficult to measure with  
854 quantitative monitoring. Capturing stakeholder's perceptions and stories of success (or  
855 failure) will help build a fuller picture of the impacts of a given MPA and allow for more  
856 holistic adaptive management efforts.

857

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859

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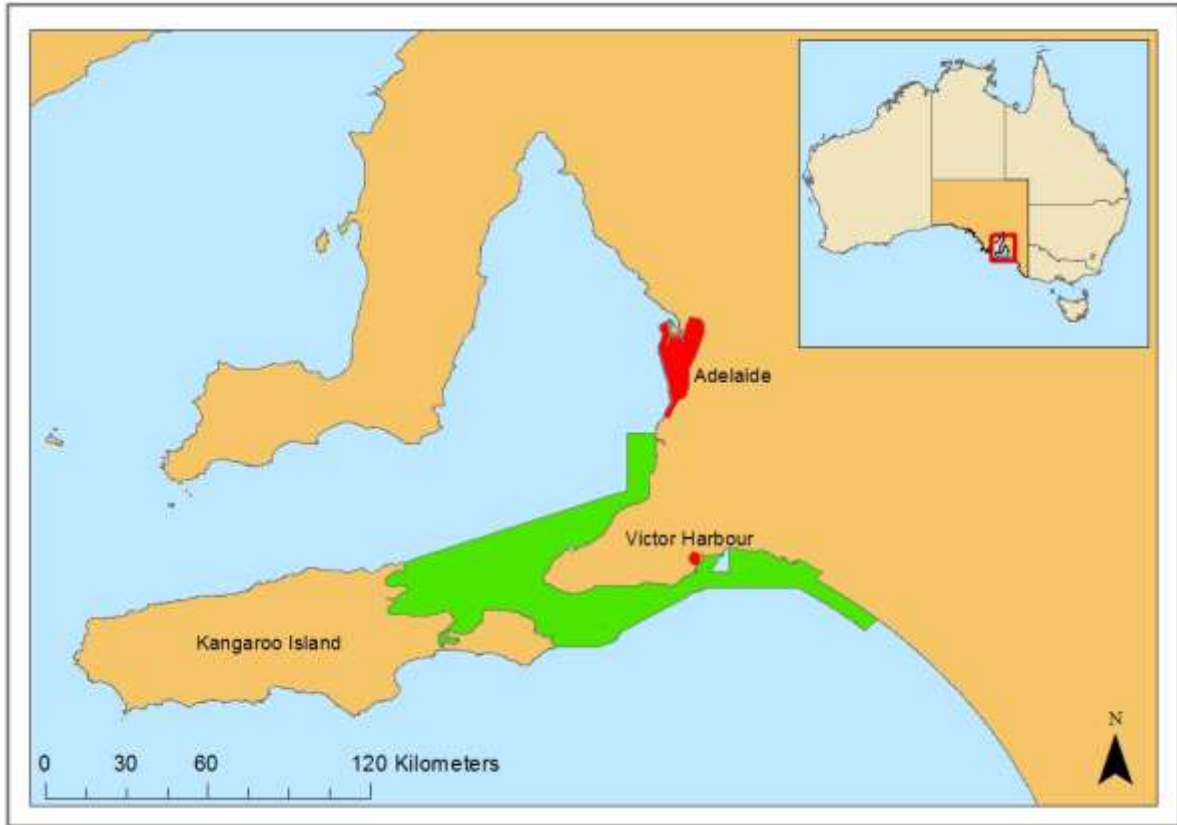
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1009 **Figures**

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1011 **Figure 1.** Map of study site, showing the Encounter Marine Park in green.



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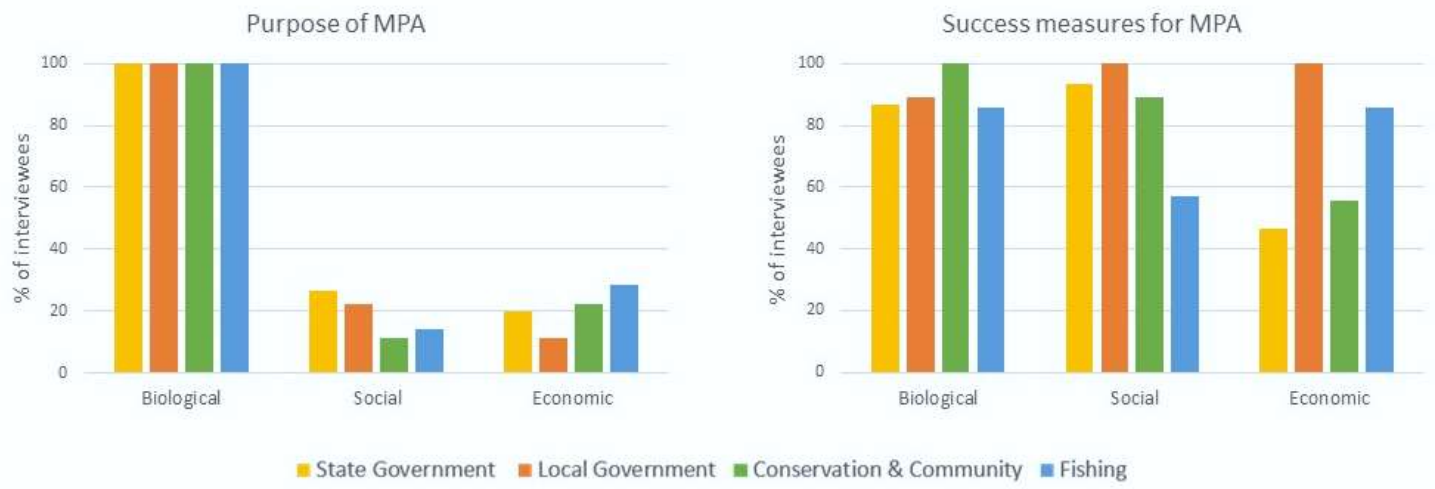
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1015 **Figure 2.** Comparison of interviewees' (n=41) stated purpose of the Encounter Marine Park

1016 and how they would measure success of the MPA.





1018 **Tables**

1019 **Table 1.** Composition of the different stakeholder groups and number of individuals  
 1020 interviewed. For analysis the private consultant was included in conservation and community  
 1021 groups.

Stakeholder Type	Sector/Division/Group	No. interviewed
State Government	Department of Environment Water & Natural Resources Primary Industries & Regions South Australia SA Tourism Commission Department of State Development Department of Transport Natural Resource Management Division	15
Local Government (Mayors, CEOs, Councilors, Environment Officers)	City of Onkaparinga District Council of Yankallilla Alexandrina Council City of Victor Harbor Kangaroo Island Council	9
Conservation and community groups	'Friends of' groups Citizen Science groups Volunteer groups	9
Fisheries	Commercial Fishing Charter Boat Operators Recreational Fishing	7
Private consultant	Marine expertise	1
<b>Total:</b>		<b>41</b>

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1026 **Table 2.** Composition of the four focus groups and locations held.

Location	Stakeholder group	No. attendees
Kangaroo Island	Fishing	7
Kangaroo Island	Conservation Interests	8
Yankalilla	Fishing	8
Victor Harbor	Conservation Interests	9
<b>Total</b>		<b>32</b>

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**Table 3.** Breakdown of responses of individual interviewees (n=41) and the four focus groups on what the purpose of Encounter Marine Park was and how they would measure the success of the Marine Park.

	Stakeholder group	(n)	Purpose of park			Measures of success		
			Biological	Social	Economic	Biological	Social	Economic
<b>Interviewees</b>	State Government	(15)	15	4	3	13	14	7
	Local Government	(9)	9	2	1	8	9	2
	Conservation & Community	(9)	9	1	2	9	8	5
	Fishing	(7)	7	1	2	6	4	6
	Consultant	(1)	1	0	0	1	1	0
	<i>Total</i>	<i>(41)</i>	<i>41</i>	<i>8</i>	<i>8</i>	<i>37</i>	<i>36</i>	<i>20</i>
<b>Focus groups</b>	Fishing	(2)	2	2	0	1	2	2
	Conservation & Community	(2)	2	1	1	2	2	2
	<i>Total</i>	<i>(4)</i>	<i>4</i>	<i>3</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>4</i>

**Table 4.** Representative selection of measures to quantify MPA success, as suggested by interviewees and focus group participants. Measures are arranged by broad and then more specific indicator categories.

<b>Indicator category</b>	<b>Measures that could be used to quantify success</b>
<b>Biological</b>	
Biodiversity	Species richness, overall abundance and biomass Presence of threatened/endemic species
Human pressure	Number of boat strikes on megafauna reported Extent of habitat damage/recovery
<b>Economic</b>	
Added value	Extent that local councils/towns advertise the marine park on their webpages Extent to which local businesses use the marine park as a promotional tool
Existing/new economic activities	Commercial fishers profit margins Number of individuals employed by commercial fisheries associated with MP Total landed catch (within a given area) Local businesses' financial support of community events Price of fish Diversity of employment opportunities (job adverts)
New economic activities	Investments in new businesses associated with marine environment Number and amount of grants provided to support new marine park-related businesses
<b>Social</b>	
Community support	If marine park is an election issue Number of negative articles vs number of positive articles in local media Levels of vandalism to marine park signs/other marine park-affiliated property
Stewardship	Number of partnerships between government authority and local industries/indigenous groups/research institutions/NGOs
Government support	Proportion of community events attended by marine park representative
Government support, Longevity	Number/area of marine parks maintained/increased in successive political cycles
Community support & community use	Number of people from the local community attending marine park-based events Reports of suspected non-compliance by local businesses and/or residents
Education & public awareness	Amount of marine park education material included by tour operators in their tours
Stewardship, Community support	The number of groups/individuals that volunteer for marine park-related work Diversity of citizen science opportunities available
<b>Socio-economic</b>	
Existing economic activities, Recreation & community use	Number of boats purchased Number of diving/wildlife-watching/similar trips occurring within park boundaries Number of recreational fishers visiting region Number of tourists visiting regional areas for marine environment-based use Occupancy rate of holiday homes Number of visitor nights

