

# Appendix I: Fisheries Assessment

This Appendix is provided in support to the following report:

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The report, submitted 18/09/2014, addresses comments made by the wider Lyme Bay Fisheries and Conservation Reserve Working Group at a Workshop 09/09/2014.

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# Acronyms and Abbreviations

CFP	Common Fisheries Policy
CL	Carapace Length
cSAC	Candidate Special Area of Conservation
DEFRA	Department for Environment, Food and Rural Affairs
DV	Devon and Severn (IFCA)
EMS	European Marine Sites
ETP	Endangered, Threatened and Protected
EU	European Union
FAO	Food and Agriculture Organisation
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authorities
M&CA	Marine and Coastal Access Act
MCS	Monitoring, Control and Surveillance
MCZ	Marine Conservation Zones
MLS	Minimum Landing Size
MMO	Marine Management Organisation
MPA	Marine Protected Areas
MSAR	Monthly Shellfish Activity Return
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
PI	Performance Indicator
PSA	Productivity Susceptibility Analysis
RBS	Registration of Buyers and Sellers
RSA	Recreational Sea Angling
RSB	Risk Based Framework
SAC	Special Area of Conservation
SO	Southern (IFCA)
TAC	Total Allowable Catch
VMS	Vessel Monitoring Systems
WGCRAB	Working Group on the Biology and Life History of Crabs
WGNEW	Working Group Assessment of New MoU Species

# Overview

## Context

The primary focus of this component of the project is to review Lyme Bay commercial fisheries with regard to sustainability practices. In addition, appropriate linkages have been made to relevant components of the program dealing with habitat, socio-economics, and management planning.

## Structure

This Appendix contains an assessment of five key fisheries. These five fisheries were identified during the Desk Review (**Appendix B**) and subsequent consultation with the Working Group as representative of a significant proportion (80%) of fishing activity within the Lyme Bay Reserve. This assessment intends to highlight the strengths and weaknesses of the fisheries in terms of stock status, impacts on the environment, and efficacy of management using the best available information.

The approach taken and rationale behind it are outlined below, followed by a synthesis of the findings by species, gear and by assessment category (Performance Indicators - PI) which draws together the key conclusions across all five fisheries and, where appropriate, considers the wider applicability of these findings to other Lyme Bay fisheries not assessed in detail.

Finally, the full text of the five fishery assessments is presented. This latter section gives more detailed information about the scoring and discussion of potential actions for different issues. The structure of the assessments is described below.

## Assessment approach

The approach to the assessment of the fisheries closely follows that of a Marine Stewardship Council (MSC) Pre-assessment. The rationale for this is that the pre-assessment procedure is considered fit for purpose – the procedure was designed specifically for fisheries assessment and uses best practice guidelines (including FAO and ISO advice) in the setting of the standards against which fisheries are assessed. The MSC is recognised as an example of good practice, and the process of assessment is clear and well documented<sup>1</sup>.

It is important to stress that while the benchmarks applied here correspond to MSC Criteria (MSC, 2013), the resulting assessment is not an MSC pre-assessment. Assessments have not been undertaken by a certified assessment body and this is a key qualifying requirement under the MSC Framework.

The key aspects of the fishery assessed are:

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<sup>1</sup> <http://www.msc.org/documents/scheme-documents/forms-and-templates/msc-pre-assessment-reporting-template/view>

- **The Stock (Principle 1)** – this looks at the target species, and examines the stock status, and whether it has management measures that are designed to keep it within sustainable limits
- **Environmental effects (Principle 2)** – this examines the effects of the fishery on bycatch species (both retained, and discarded), endangered, threatened and protected (ETP) species, and habitats; as well as looking at likely overall effects on the ecosystem
- **Management (Principle 3)** – here, the general management “framework” is looked at, in terms of how effective it is in supporting sustainable management of both the stock and environmental fishery effects.

Within each category (Principle), there are a series of PIs (Performance Indicators) – these question specific aspects such as whether there is sufficient information available, or whether certain technical measures are in place. Through these PIs, each Principle is explored in a systematic and fairly detailed way.

### Supporting information

Project Inshore (Southall *et al.*, 2013) is a recent national MSC pre-assessment of all inshore fisheries in England. The Project Inshore pre-assessments provide a good amount of detail, with many fisheries scored to IFCA or regional (i.e. Western Channel) level. As such, the Project Inshore report has been used as the basis for this assessment, and key information has been extracted for the fisheries at the most local level available. What this report adds is a more thorough consideration at the local level that considers additional management measures or knowledge specific to Lyme Bay. Additional information is added where it is available. Local initiatives (existing and forthcoming) by the Working Group and both Devon & Severn and Southern IFCA have been discussed and integrated into the assessment. On the basis of this information, advice on possible actions that might be taken at a Lyme Bay level is then suggested.

In some cases, such as for stocks which are appropriately managed at a national or regional level, no action or recommendations are appropriate. However, where there is likely to be some scope for “added value” to address gaps or improve implementation through action by the Working Group or its members, this is highlighted.

In addition to Project Inshore, key supporting documents for this report include the MSC Certification Requirements version 1.3 and the MSC Pre-assessment scoring template (MSC, 2013). Re-scoring of one bycatch species was undertaken using the Risk Based Framework PSA approach. Cefas stock assessments for crab and lobster are used, and MMO fisheries evaluations for the English Channel (MMO, 2012) provided additional information for some species. All references are included in the text of the assessment reports.

## Choice of species

The species were chosen initially on the basis of MMO sales and landings data from twenty inshore vessels that gave consent for this data to be provided at original resolution. While the data in the received format is commercially sensitive, it was combined and analysed after selecting only the records relevant to the Lyme Bay inshore area (within 6nm). The combined data provided summary information that is totally anonymous. It was used to characterise the fisheries within the Desk Review element of the project.

The majority of landings, both by weight and value, originated from a relatively small number of key fisheries. Twelve of these fisheries (representing over 95% of landings and sales) are described in the Desk Review. The intention was to select a smaller number of species and put these through an assessment (following the MSC approach described above). Initially, the species chosen were: crab, lobster, whelk, cuttlefish and thornback ray in order to optimise the proportion of catches (and collectively these five target species comprised 80% of sales and 88% of landings).

However, consultation with representatives from the Working Group suggested that, while crab, lobster and whelk were important fisheries within the Designated Area, sole and bass were likely to be more important target species for the inshore fisheries (using gears permitted within the Designated Area) than cuttlefish and thornback ray. A revised list was put in front of the Working Group at a meeting in May, and there was consensus support for the selection. In combination, the five species comprise 77% of sales and 84% of landings, and are thought to represent a good cross section of fisheries types within Lyme Bay. This consensus reached by the Working Group consultation is particularly important as one potential limitation of the data is that it only represents a sub-section of the fleet; while trends are believed to be broadly representative, the importance of some species was not necessarily fully expressed in terms of the figures but may have been captured during consultation.

For the purposes of the assessment, it was necessary to choose the gears by which the species are targeted – and while crab, lobster and whelk all have clear principal target gear, both sole and bass may be caught by multiple methods within Lyme Bay. In order to consider the widest variety of impacts, the use of nets for targeting sole, and lines for bass was chosen. Part of the benefit of this is that while the Principle 1 scoring is fishery-specific, much of the Principle 2 assessment is relatively generic within a given gear type. This means that many (if not all) of the recommendations for sole netting can be applied to other species fished in the same way; the same is true for the use of lines to target species other than bass. Where this has been possible, the wider applicability of recommendations from the assessments has been noted within the synthesis section of this Appendix.

# Assessment of Lyme Bay Fisheries

## Structure of assessment

The fishery assessments are reported here in a proforma which clearly shows what is being assessed, the likely outcome (colour coded) indicating pass, a pass with condition, or failure to meet the standard. There is an explanation for the scoring, and a suggestion of any recommendations or actions that might be appropriate in the Lyme Bay context. There is an effort to use non-technical language as far as possible, so that the narrative is clear.

**Table I1** shows the assessment results in overview, and is colour coded to highlight the scoring for each Performance Indicator.

## Synthesis

Following **Table I1** a non-technical summary is provided per species assessment, drawing together the main conclusions and discussing, where appropriate, how they may be extended to other, similar fisheries not assessed in detail here. For more in depth information on how the scoring was reached, please refer to the full detail of the assessments in the subsequent sections.



**Table I1:** Assessment scoring summary – click on the species name to be taken to the assessment

Principle	Component	PI no.	Performance Indicator	Likely scoring				
				<a href="#">Crab</a>	<a href="#">Lobster</a>	<a href="#">Whelk</a>	<a href="#">Sole</a>	<a href="#">Bass</a>
1	Outcome	1.1.1	Stock status	>80	<60(SO), 60- 80(DV)~	<60 (RBF*)	>80	<60 (RBF*)
		1.1.2	Reference points	>80	>80	80 (RBF)	60-80	80 (RBF)
		1.1.3	Stock rebuilding	N/A	<60~	N/A	>80	N/A
	Management	1.2.1	Harvest Strategy	60-80	<60~	<60	>80	60-80
		1.2.2	Harvest control rules and tools	>80	<60~	<60	60-80	<60
		1.2.3	Information and monitoring	60-80	60-80	<60	>80	60-80
		1.2.4	Assessment of stock status	60-80	60-80	80 (RBF)	>80	80 (RBF)
2	Retained species	2.1.1	Outcome	60-80	>80	80 (RBF)	60-80	>80
		2.1.2	Management	60-80	>80	60-80	60-80	>80
		2.1.3	Information	>80	>80	60-80	60-80	>80
	Bycatch species	2.2.1	Outcome	>80	>80	>80	60-80	>80
		2.2.2	Management	>80	>80	>80	60-80	>80
		2.2.3	Information	>80	>80	>80	60-80	>80
	ETP species	2.3.1	Outcome	60-80	60-80	60-80	60-80	>80
		2.3.2	Management	60-80	60-80	60-80	60-80	60-80
		2.3.3	Information	60-80	60-80	60-80	60-80	>80
	Habitats	2.4.1	Outcome	>80	>80	>80	>80	>80

Principle	Component	PI no.	Performance Indicator	Likely scoring				
		2.4.2	Management	>80	>80	>80	>80	>80
		2.4.3	Information	>80	>80	>80	>80	>80
	Ecosystem	2.5.1	Outcome	>80	>80	>80	>80	>80
		2.5.2	Management	>80	>80	>80	>80	>80
		2.5.3	Information	>80	>80	>80	>80	>80
3	Governance and Policy	3.1.1	Legal and customary framework	>80	>80	>80	>80	>80
		3.1.2	Consultation, roles and responsibilities	>80	>80	>80	>80	>80
		3.1.3	Long term objectives	>80	>80	>80	>80	>80
		3.1.4	Incentives for sustainable fishing	60-80	60-80	60-80	>80	60-80
	Fishery specific management system	3.2.1	Fishery specific objectives	60-80	60-80	<60	>80	60-80
		3.2.2	Decision making processes	60-80	60-80	60-80	>80	60-80
		3.2.3	Compliance and enforcement	>80	>80	>80	>80	60-80
		3.2.4	Research plan	60-80	60-80	<60	>80	60-80
		3.2.5	Management performance evaluation	60-80	60-80	<60	>80	60-80

\* For species where data on stock is limited, the MSC Risk Based Framework (**RBF**) is used.

~ Aspects of the lobster stock assessment depend on how the Lyme Bay stock is categorised (see assessment for detail). Pending clarification from Cefas, some scoring could be updated.

### Key to Likely scoring level

Information suggests fishery is not likely to reach SG60 and therefore would fail on this PI	<b>&lt;60</b>
Information suggests fishery will reach SG60 but may need a condition for this PI	<b>60-79</b>
Information suggests fishery is likely to exceed SG80 resulting in an unconditional pass for this PI	<b>≥80</b>

## Summary by Species

### Brown crab

The stock status of brown crab is good regionally, according to recent Cefas assessments. There is an overview of stock assessment at an ICES level through the “WGCRAB” working group. The Lyme Bay fishery is part of the wider Western Channel stock, and action taken in terms of additional management probably won’t have an effect at the level of this “unit”. However, despite the good status of the stock, there is currently a shortage of information sufficient to support harvest control rules – in particular, fishery data is not accurate enough in its current format.

While there are management measures, the lack of accurate fishery data and a fishery-specific management plan for brown crab means there is no mechanism of feeding stock information into management. The Fully Documented Fishery project has the potential of providing excellent fishery data of the sort that would be useful as part of a management plan, and while this is unlikely to be able to support management at the stock level unless rolled out more widely, local management would benefit from it.

Local measures such as the potting effort cap within Lyme Bay, pot construction (escape gaps etc.) specified within IFCA Byelaws, and proposed measures introduced under the permitting Byelaw (as permit conditions) within the Devon & Severn IFCA District all strengthen the management of this fishery. The Plymouth University potting study should provide excellent information that will help to inform management of potting intensity on the local stock and environment.

Whilst escape gaps help towards better management of bycatch, either through the Devon & Severn IFCA Byelaw or voluntary/funded through Southern IFCA, bycatch is not a major issue in Lyme Bay. . There is little in the way of non-retained species and survivability of discards is high. A code of conduct relating to endangered, threatened and protected (ETP) species would be a good precautionary action, although the risk from this and other potting fisheries is not high; inshore VMS data could demonstrate to a higher level of certainty the extent to which the fishery interacts with Species and Habitats of Conservation Importance.

### Lobster

The stock status of lobster in the Southern IFCA District (as part of the South Coast stock unit) is unfavourable, highly likely to be below safe biological limits for recruitment and below target levels – within the western channel part of the Devon & Severn IFCA District, stocks are likely to be above minimum limits but not at target levels equivalent to stock at MSY (Maximum Sustainable Yield). In reality, the Lyme Bay stocks are clearly not divided in this way, but there is no information to ascertain which of the stock units it is most “like” for the purposes of assessing the status locally.

This means that under Principle 1, there are a lot of failing scores for this species. The most sensible approach to addressing this at a local level would seem to be trying to determine the closest “fit” for the Lyme Bay stocks. This might be clarified with the help of Cefas, and is something the Working Group should pursue. It might be possible to get the boundary used in stock assessments moved so that Lyme Bay is assessed fully under one stock unit.

As for crab, lobster do not have a species-specific management plan, and current measures (principally MLS, but also protection of berried animals) do not appear to be enough to ensure the fishery is harvested sustainably. There is also a discrepancy between the minimum landings size used in each IFCA District, and there are implications here for how effective enforcement of the larger size limit could be within Lyme Bay.

Additional harvest control would be possible at a local level, with a potential mechanism being conditions attached to permits under IFCA Byelaw (such as the one being prepared by Devon & Severn IFCA); these could adapt according to changes in stock status, and could form the basis of a strategy which might be set down in a management plan. Examples of potential measures include pot limitations, and a maximum landing size. However, for management to be effective there is a need for better information on the local stock, as well as more accurate fishery information. The latter could be derived from the Fully Documented Fishery project, and aspects of biological information are likely to be provided by the University of Plymouth potting study. Liaison with Cefas would be sensible to discuss how local efforts could complement work undertaken by them at a regional level.

As for crab, monitoring of ETP interactions would ensure that the risk is low, and highlight if any action is needed, although this is unlikely to be the case.

## Whelk

The stock status of whelk is not known, and at the time of assessment there were no stock assessments, although Cefas has started work towards this (Lawler, 2013), and Devon & Severn IFCA has also been doing work within its District. The lack of a current stock assessment, and the relative risk that fisheries pose to this species has led to a precautionary assessment (under the Risk Based Framework) of failure to meet standards. In contrast with crab, which are relatively mobile and therefore appropriately assessed at a regional level, whelk are much more locally associated (Hancock, 1967) so any management within Lyme Bay would stand a greater chance of having an impact on stock status.

As size at maturity varies geographically, determining this characteristic within the local whelk population is important, and could easily translate to management measures such as a revised minimum landing size. Again, a species-specific management plan is lacking, and is something that the Working Group might consider developing when sufficient information is available to support it. In addition to biological data, there is a need for fishery data, which could be supplied by the Fully Documented Fishery Scheme, locally.

This would also help understand the impact, if any, on retained bycatch – this is thought to be primarily spider crab, but it is not clear how significant any bycatch is as a component of total catch. Where a species is present in very small amounts (less than 5% of total catch), it is not considered that the fishery is likely to pose a risk. Currently, catch composition is unknown. As for crab and lobster, monitoring of ETP interactions would ensure that the risk is low, and highlight if any action is needed, although this is unlikely to be the case.

Given the high importance of this species within the local inshore fishery, and the chance that management measures could have a local impact, it might be considered that whelk are a priority in terms of action. The results of Cefas' whelk stock assessment work should be taken into account in developing suitable management locally. Devon & Severn IFCA already has plans to feed the results of recent research on whelks (focused on size and sexual maturity) into measures within a proposed potting permit Byelaw, which provides an effective way to implement adaptive management.

### Sole

The stock status for sole (Western Channel, ICES Area VIIe) is assessed at an ICES level, and is good, currently above target and limit reference points. As a quota managed species, there is a comprehensive fishery-specific management plan which means that scores under P3 (Management) are good, too. In terms of the fishery itself, and in view of the favourable status, there is not likely to be any big wins from additional management at a local level; however, this fishery assessment did highlight the need for better understanding of catch composition in netting fisheries, which is discussed below.

### Bass

The stock status for bass is not currently known, and under the Risk Based Framework it failed to meet the MSC standard. However, the species has recently been adopted within ICES as part of the Working Group WGNEW, so there is effort underway to address this. As a mobile species, it is felt that stock assessment is most appropriate at a regional level, and therefore there are no clear actions recommended for the Working Group; however, part of the lack in current understanding is the appropriate stock units at which bass should be assessed. If any of the units eventually chosen strongly overlap with Lyme Bay, there would clearly be scope to be more directly involved in stock management.

One of the key issues highlighted by the assessment is the uncertainty regarding how much recreational fisheries contribute to overall fishing effort (nationally, Cefas have started to assess this, although at the time of writing the results were not publicly available. It is possible that significant levels of effort are not recorded by commercial records, which presents problems both for fishery assessment, and compliance monitoring. Better understanding of the impact of recreational fishing is something that could be addressed within Lyme Bay, by combining the increased monitoring of fishery removals within the Fully Documented Fishery scheme with some form of monitoring (either survey based, or via voluntary reporting) for the recreational sector, although this may be contentious.

There is a requirement for IFCA's to manage fisheries with regard to the recreational sector, although currently most are developing their work in this area. Cefas recently undertook a survey of recreational fishing for bass, and the findings of this should be helpful going forward.

The findings of the assessment in relation to lining are discussed below.

### Wider application of findings

For the key fisheries (top twelve) not assessed in detail here, a quick comparison was done looking at Project Inshore results and on this basis of mapping them to the fisheries under assessment. **Table 12** shows the results of this comparison. The general findings for the “matched” fishery can be applied broadly to these species.

**Table 12:** Mapping non-assessed fisheries to assessments

Non assessed target species	Matched fishery and rationale
<b>Brown shrimp (<i>Crangon crangon</i>)</b>	None – however, this is targeted by beam trawl predominantly, so is not fished within the Designated Area.
<b>Cod (<i>Gadus morhua</i>)</b>	Sole - this is an ICES assessed stock with good status. See also bass (for P2 scoring only, wrt line fisheries).
<b>Cuttlefish (<i>Sepia officinalis</i>)</b>	Whelk – there is poor stock data for this fishery, and potentially bycatch of spider crab.
<b>Plaice (<i>Pleuronectes platessa</i>)</b>	Sole – this is an ICES assessed stock with good status, targeted by netting.
<b>King scallop (<i>Pecten maximus</i>) (Hand dived)</b>	For P1 – Whelk (data poor shellfishery). P2 – Bass (low impact, high selectivity and low ecosystem risk). P3 – crab or lobster (lack of fishery-specific management plan).
<b>Spider crab (<i>Maja squinado</i>)</b>	Whelk – stock status unknown, no management strategy. Spider crab is actually assessed under P2 of the Whelk assessment, but as a bycatch species only.
<b>Thornback ray (<i>Raja clavata</i>)</b>	For P1 – bass (data poor regarding stock). For P2 – netting (need better bycatch information). For P3 – none (fails PI 3.2.2 as the management system has allowed decisions to deviate from scientific advice).

Of note is the need for information on spider crab as both a target species (in terms of stock understanding) and as a component of bycatch in potting and occasionally netting fisheries. As for whelk, any work to look at the status of spider crab would help address the risk to this species from fisheries as a bycatch species (as assessed here) and as a target fishery in its own right. Since the principal management measure for spider crab is a MLS, and the size at maturity is known to vary geographically, understanding how local stocks may compare both to studied populations and (importantly) to the minimum landing size could inform

management at a local level. This will be supported through the Devon & Severn IFCA permit Byelaw to increase females MLS to the same as that for the male.

The implications of species assessments are also discussed in general terms below, within the summary for Principle 1 (stocks).

## Summary by Gear

### Potting

Pot fisheries targeting crab, lobster and whelk form a majority of landings from the Lyme Bay Designated Area. All three fisheries are assessed, and while there are differences in construction between fisheries (notably the whelk fishery, which does not use parlour pots common to crustacean fisheries), potting in general is treated as a low impact fishery in terms of environmental effects. Species caught can be landed, juveniles returned alive to the fishery, and discarded bycatch (such as hermit crabs and shore crabs) also have a high probability of survival. Benthic effects are thought to be minimal (with peer reviewed evidence of this – Eno *et al.*, 2001) and so overall there is a very low risk to ecosystem function from the fisheries.

There is a question mark over interaction with ETP species, although this is more related to a lack of data rather than the perceived risk, which is thought to be low. All pot fisheries are lacking fishery-specific management; at a species level this is discussed above, but effort management can be addressed at a gear level and is already something that Devon & Severn IFCA have identified, with a potential permitting byelaw in consultation as a potential management measure.

The potting study being undertaken by University of Plymouth with the support of the Working Group in Lyme Bay has the potential to strengthen the information base for all potting fisheries, as it aims to investigate the effects of different intensity levels on stock and habitat at a local level. This could be a basis for fishery-specific or gear-based management; the Fully Documented Fishery scheme can also be an excellent source of fishery information, providing landings data at a better resolution than is currently available by the Monthly Shellfish Activity Return (MSAR) catch returns. Spatial effort data from the inshore VMS provide a means of addressing current uncertainty over risk to ETP species.

### Netting

Net fisheries score well in terms of habitat impact, with very low risk of damaging the seabed (Southall *et al.* 2013). As for pot fisheries, there is some uncertainty over the nature of interaction with ETP species, which can be addressed using spatial data from inshore VMS. The key shortfall under the MSC assessment relates to bycatch of both retained and discarded species.

There is currently no information on the catch composition within static netting fisheries that would support any sort of quantitative analysis. For target species – i.e. all those landed

– this information would be available via the Fully Documented Fishery Project. For non-retained (discarded) species there would need to be a dedicated monitoring or reporting scheme in order to get this data. This could be introduced as a voluntary incident recording process, but would benefit from observer trips with some quantitative data on species, numbers and/or weight of discards. Since there is also a potential risk to seabirds and other ETP species (cetaceans), the occurrence (or lack) of these incidents could be recorded at the same time.

There are obviously cost implications in any observer scheme which may mean it is not viable; there may be opportunities to improve bycatch and ETP monitoring as part of existing responsibilities (such as incorporating additional fields in existing boardings and sightings data collected by MMO and IFCA Officers), and arguably this might be seen as falling within the broad remit of such bodies with respect to managing fisheries sustainably within an ecosystem based approach as mandated within statutory duties.

However, the most cost effective and practical way to do this is best discussed by the relevant authorities and other stakeholders within the Working Group. The simplest way to address management of discards and particularly ETP interactions in the short term is by developing a simple Best Practice Guide, which could be distributed to all vessels, and provide basic advice on handling (to minimise mortality) and encourage reporting of ETP sightings or encounters. This could be referred to within the Code of Conduct as a further voluntary measure.

### Lining

Line fisheries score extremely well, with unconditional passes across all Performance Indicators except 2.3.2 (ETP species management). The means of addressing this are covered in the discussion on netting, above.

## Summary by MSC Principle

### P1 – Stocks

For most species, and all mobile species, the unit of stock is at a regional rather than local level, so management action may not have an impact, although for whelk in particular there is a strong case for local management measures being effective. However, this does not mean that local management is not useful – or would not be a benefit to the local fishery. For crustacean species, the intensity of exploitation may have proportionally higher implications for recruitment in inshore nursery areas, in which case effort to protect the spawning stock is particularly important. And while lobster stocks are assessed regionally, the current boundary is not logical and suggests a split of Lyme Bay fishing grounds where none exists. This leads to confusion as to the stock status.

Additional control of effort through voluntary and statutory (byelaw) restrictions is most useful for non-quota species such as shellfish, where harvest control at a higher level is



limited to minimum landing size. Here, local management contributes towards at least a partial management strategy for the fishery; however most fisheries lack any integrated management plan that feeds information from research and monitoring into adaptive harvest control rules. The formulation of basic research plans (at least for shellfish species) is something that the Working Group might like to consider.

## P2 – Wider environmental effects

In general, there is not thought to be a risk from the majority of Lyme Bay fisheries on the ecology of the Designated Area, primarily because they are targeted with static gear which is believed to have low benthic impact, and be either highly selective or allow non-retained bycatch to be returned alive.

The bycatch of netting fisheries (in terms of both retained and discarded species) is not clearly understood; monitoring of retained non-target species in netting and potting fisheries can be addressed by using data from the Fully Documented Fishery work, which should be analysed to determine catch composition. Non-retained (discarded) bycatch would require additional research, but would be a useful thing to consider; this could feed into the evidence base for a potential Devon & Severn IFCA net permitting byelaw.

The level of interaction with ETP species is thought to be low for all fisheries, although spatial data from inshore VMS could and should be used to help improve understanding of spatial overlap, where good spatial data on ETP distribution exists. Some means of monitoring interaction – such as reporting of cetacean entanglements, or seabird mortality in net fisheries – would help assess risk, perhaps as part of a voluntary reporting scheme. A precautionary bycatch handling Code of Conduct would demonstrate that fishery effects are being considered, although compliance monitoring will always be difficult. Further consideration of environmental risks of fisheries is contained in the Risk Assessment (**Appendix D**).

## P3 – Management

In general, the higher level management framework for all fisheries is sound. The main gaps in the current system at a policy level relate to “incentives for sustainable fishing”, particularly for non-quota species (which account for the majority of catch within Lyme Bay). Since access to these is generally open, there is a sense that there is no ownership of the resource, and hence less of an incentive to participate in sustainable practices. In practice, and certainly within the Working Group, this is clearly often not the case and many inshore fishermen are keen to adjust their fishing patterns and practices towards increasing long term sustainability of stocks. However, there is not full buy in to the Code of Conduct, which means that even locally there is a varying degree of participation in sustainability initiatives.

Further, most fisheries lack a strong fishery-specific management system or plan. While much of the action to address this is needed at a national or regional level, there are

certainly measures which can be taken and can be effectively locally, and the creation of even a basic strategy for key species should be considered. This might be as simple as a document summarising the key management measures, responsible parties and their roles, how local management allies with wider efforts (regional, national), where issues exist at all levels, and how best available evidence is actioned in terms of directly informing harvest control or technical measures. In general, much of the work takes place, but is split across different authorities or institutions and so is not set out in a strategic way; therefore in many cases a management plan is simply formalising that which is already implicit.

Lastly, it is important that any measures that are applied locally apply as broadly as possible to all vessels within the fishery. In particular, harvest control, if it can be effective at a local level, is only likely to be so where it applies to a significant proportion of fishery removals. This applies to differences across jurisdictions, such as between the two IFCAs; it also means that the Code of Conduct, in its current voluntary form, would need total uptake if it is to form the key management mechanism. In practice, it is likely that statutory management would be more effective. In parallel to this is the need to involve the recreational fishery in some way, particularly with respect to bass management but ultimately for all species taken by non-commercial vessels.

# Brown crab (*Cancer pagurus*), Potting

## Principle 1

### Outcome

<p>PI 1.1.1 <i>Outcome</i></p> <p><b>Stock status:</b> The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Recent Cefas assessments of the Western Channel Brown Crab stock show that it is at sustainable levels (Cefas, 2011), with fishing mortality close to <math>F_{msy}</math> and stock biomass close to or at <math>B_{msy}</math> (Southall <i>et al.</i>, 2013). There is not anything to suggest that the stock within Lyme Bay is significantly distinct from this wider stock.</p>	
<p><b>Additional requirements/recommendation:</b> Currently, Cefas assessments are the main basis for assessing the local stock. Since the stock “unit” is regional, and Western Channel stocks are doing ok, there’s not a strong need for action identified.</p>	
<p>PI 1.1.2 <i>Outcome</i></p> <p><b>Reference points:</b> Limit and target reference points are appropriate for the stock</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Again, Cefas’s reference points used to assess the Western Channel stock status are appropriate: target reference point is 35% spawning potential @ <math>F_0</math>; limit reference points are 50% MSY (of <math>F_{msy}</math>) (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Again, this relies on regional assessments undertaken by Cefas. The reference points used are deemed to be appropriate – no action needed.</p>	
<p>PI 1.1.3 <i>Outcome</i></p> <p><b>Stock rebuilding:</b> Where stock is depleted, there is evidence of stock rebuilding within a specified timeframe</p>	<p>Likely scoring: N/A</p>
<p><b>Why:</b> Recent assessments by Cefas (2011) indicate that the stock is not depleted.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

## Management

<p>PI 1.2.1 Management  <b>Harvest strategy:</b> There is a robust and precautionary harvest strategy in place</p>	<p>Likely scoring:  Pass with condition</p>
<p><b>Why:</b>  The principal harvest strategy is the use of a high MLS. This is probably fine, and precautionary enough to work – by protecting spawning stock biomass and allowing crabs plenty of time to reproduce before reaching fishable size (Southall <i>et al.</i>, 2013). The voluntary pot limitation measures within the Reserve could be seen as an additional level of protection – and might elevate the score above the Project Inshore assessment to SG80, but to qualify as “robust” there’s a need to tie the strategy in with the state of the stock.</p>	
<p><b>Additional requirements/recommendation:</b>  A basic management plan to allow changes to local management measures in the event of a stock decline is likely to satisfy this.</p>	
<p>PI 1.2.2 Management  <b>Harvest control rules and tools:</b> There are well defined and effective harvest control rules in place</p>	<p>Likely scoring:  Pass</p>
<p><b>Why:</b>  Technically, changes to current technical measures (such as MLS) could be used to control or counter the effects of increased exploitation on the stock (Southall <i>et al.</i>, 2013) and within Lyme itself, the additional harvest control of pot limitations (via the Code of Conduct) could also be seen as a check on increasing exploitation rates (which is in addition to the management at a regional level).</p>	
<p><b>Additional requirements/recommendation:</b>  For this effort control to have a real effect on the level of the stock (Western Channel), it would have to apply over a wider area. On this basis, a “proper” pre-assessment would likely score a conditional pass (60-80). IFCA permitting byelaw and/or a Regulating Order could incorporate harvest control rules.</p>	
<p>PI 1.2.3 Management  <b>Information and monitoring:</b> Relevant information is collected to support the harvest strategy</p>	<p>Likely scoring:  Pass with condition</p>
<p><b>Why:</b>  There is information available on sales (from MMO returns), effort (from MSAR Shellfish Returns) and Cefas also undertake port biosampling to support length frequency-based cohort analysis (Cefas, 2011). However, fishery data is not accurate enough to support well defined harvest control rules (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b>  At a local level, better landings and effort data collection would help to address this gap. There is some descriptive analysis on potting fisheries by Devon &amp; Severn IFCA (Clark, 2008), but this was a standalone report rather than part of ongoing monitoring. The Fully Documented Fishery project and iVMS provide the tools to address these information gaps if rolled out in the future. The University of Plymouth potting study underway will also provide key information.</p>	

<p>PI 1.2.4 Management</p> <p><b>Assessment of stock status:</b> There is an adequate assessment of the stock status</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There is analytical assessment of stocks, and uncertainty (e.g. over the rate of natural mortality, and growth rate estimates, both of which can make a big difference to results of the assessment model) is identified but it is not taken into account within the assessment (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Accounting for uncertainty within the assessment would increase the score – but this likely to be possible only as fishery data improves (see above). Liaison with Cefas to see how improvements at a local level could support assessments might be productive.</p>	

## Principle 2

### Retained species

<p>PI 2.1.1 Retained Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> Main retained species (lobster) are likely (but not “highly” likely) to be within biologically based limits (Southall <i>et al.</i>, 2013). Spider crab, as a minor retained species, are highly likely to be within limits (and are included on Cefas’ under-utilised species list<sup>2</sup>).</p>	
<p><b>Additional requirements/recommendation:</b> The potting fishery is, strictly speaking, targeting both crab and lobster – any management measures targeting lobster stocks would improve the score here.</p>	
<p>PI 2.1.2 Retained Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> Technical measures for the conservation of lobsters (ban on landing berried animals) in both IFCA Districts count towards a management strategy. The brown crab fishery in Lyme is unlikely to hinder the recovery of lobster stocks – the voluntary pot limitation contributes to this, too. Undersized animals are returned, and escape gaps, which have good uptake within Lyme Bay (and are compulsory within the Devon &amp; Severn IFCA District) allow juveniles to escape, reducing impact from predation by larger animals.</p>	
<p><b>Additional requirements/recommendation:</b> See assessment for lobster (P1) as this is the main retained bycatch in this fishery.</p>	
<p>PI 2.1.3 Retained Species</p> <p><b>Information/Monitoring:</b> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The combination of Regulation of Buyers &amp; Sellers &amp; shellfish returns data should be sufficient to detect any increased risk by the fishery on retained bycatch (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Any additional information on catch composition and effort for crab and lobster (together and individually) such as IFCA research and/or the inshore VMS, fully documented fisheries project etc. will support information and monitoring of all elements of the catch.</p>	

<sup>2</sup> <http://cefass.defra.gov.uk/our-science/fisheries-information/under-utilised-species.aspx>

## Bycatch species

<p>PI 2.2.1 Bycatch Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Pot fisheries' key bycatch consists of shore crab, velvet and other swimming crab species – all of which are “low risk”; post capture survival is high, too, allowing non-target bycatch to be returned to the sea alive (Southall <i>et al.</i>, 2013). The use of escape gaps in local fisheries reduces risk to smaller species and undersized crustacea.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.2.2 Bycatch Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Although bycatch species are unlikely to be at risk from pot fisheries, there is not a clear strategy in place concerning bycatch. The scoring in Southall <i>et al.</i> (2013) is related to the low risk that pot fisheries are known to present</p>	
<p><b>Additional requirements/recommendation:</b> It might be a good idea to consider including bycatch handling within the Code of Conduct.</p>	
<p>PI 2.2.3 Bycatch Species</p> <p><b>Information/Monitoring:</b> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is not very much information collected on non-target bycatch species, although the risk from this fishery is very low so the level of monitoring might be appropriate.</p>	
<p><b>Additional requirements/recommendation:</b> Any further information on the level and type of non-target bycatch would be useful. Southern IFCA are currently carrying out a study which might provide this information.</p>	

## ETP species

<p>PI 2.3.1 ETP Species</p> <p><b>Outcome status:</b> The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is not likely to be a strong risk of harm to ETP species, and management under various regimes including Natura 2000 designations (cSAC) should address risk of interaction between the fishery and ETP species. However, there is not data to assess rates of interaction.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Spatial data (from iVMS and the Fully Documented Fishery project) will likely to provide better information to assess ETP interaction and confirm the level of risk the fishery presents.</p>	
<p>PI 2.3.2 ETP Species</p> <p><b>Management strategy:</b> The fishery has in place precautionary management strategies designed to: meet national and international requirements; ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; ensure the fishery does not hinder recovery of ETP species; and minimize mortality of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There are some relevant management measures at a higher level regarding ETP species (through species and biodiversity action plans nationally, and as part of the SAC), but not a strategy that sees this directly implemented at a fishery level.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>A strategy could be embedded in the Code of Conduct, or another voluntary good practice scheme – on a practical level, this could be documented training on how to avoid ETP interactions and reporting of any encounters. The Plymouth Potting study hopes to determine a level of effort that will not damage seabed habitat and species, and could feed into a Code of Conduct. Monitoring is technically needed (at least, to score higher at MSC assessment) to see whether the strategy is being implemented and succeeding.</p>	
<p>PI 2.3.3 ETP Species</p> <p><b>Information/Monitoring:</b> Relevant information is collected to support the management of fishery impacts on ETP species, including: information for the development of the management strategy; information to assess the effectiveness of the management strategy; and information to determine the outcome status of ETP species.</p>	<p>Likely scoring: Pass with condition</p>



**Why:**

There is some information on distribution of ETP species, and fisheries effort – but little linking the two (i.e. the frequency of interaction between the potting fishery and ETP species). So while there is broad understanding of likely impacts, there is not sufficient data for quantitative assessments.

**Additional requirements/recommendation:**

Improvements in fisheries data – and particularly spatial information from the Fully Documented Fishery Project – can definitely help here, but better understanding or monitoring of potting interactions with ETP species is the main thing lacking (see above).

## Habitats

### PI 2.4.1 Habitats

**Outcome status:** The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function

Likely scoring:  
Pass

**Why:**

Potting fisheries in general are thought to have a lesser and more local impact than many other gear types on habitat (Southall *et al.* 2013). A study by Eno *et al.* (2001) on Lyme Bay potting fisheries showed that there was little or no immediate impact on sensitive benthic species.

**Additional requirements/recommendation:**

None.

### PI 2.4.2 Habitats

**Management strategy:** There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types

Likely scoring:  
Pass

**Why:**

Where there is low interaction (as for potting fisheries) between gear and habitats, limited management is needed (Southall *et al.* 2013). The voluntary restriction on potting effort in Lyme is likely to be enough to satisfy requirements.

**Additional requirements/recommendation:**

Strengthening management by feeding in information from spatial monitoring (VMS) to condition monitoring assessments within the Reserve (as will be required within the SAC) would improve the strategy, as well as incorporating any recommendations from the University of Plymouth potting study.

### PI 2.4.3 Habitats

**Information/Monitoring:** Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.

Likely scoring:  
Pass

**Why:**

Good VMS data within the Lyme Bay Reserve should allow an unconditional pass. There is a potting study underway which should further improve the information available to support management of fishery impacts.

**Additional requirements/recommendation:**

This is dependent on the right information being collected and fed back into monitoring of habitat condition.

## Ecosystem

### PI 2.5.1 Ecosystem

**Outcome status:** The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function

Likely scoring:

Pass

**Why:**

Potting has a low habitat impact and is highly selective, with discards generally returned alive. There is little risk of damage to the wider ecosystem (Southall *et al.* 2013).

**Additional requirements/recommendation:**

None.

### PI 2.5.2 Ecosystem

**Management strategy:** There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function

Likely scoring:

Pass

**Why:**

There is management addressing ecosystem effects of fisheries on a national level, through MPA networks such as EMS and MCZ. Locally, IFCA Byelaws on pot construction (including escape gaps) further improve the selectivity of sizeable target species; sensitive habitat interaction is low and comprehensive voluntary spatial monitoring (inshore VMS) is in place.

**Additional requirements/recommendation:**

None.

### PI 2.5.3 Ecosystem

**Information/Monitoring:** There is adequate knowledge of the impacts of the fishery on the ecosystem

Likely scoring:

Pass

**Why:**

There is good information on ecosystem impacts of potting fisheries, including a study with a local component (Eno *et al.* 2001).

**Additional requirements/recommendation:**

Monitoring of impact could be improved by integrating catch and effort data with habitat data, which could be analysed to help monitor any changes in the ecosystem in conjunction with fishery changes.

## Principle 3

### Governance and policy

<p>PI 3.1.1 Governance and Policy</p> <p><b>Legal and/or customary framework:</b> The management system exists within an appropriate and effective legal and/or customary framework which ensures it: is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and incorporates an appropriate dispute resolution framework</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The framework of international (EU CFP), national and regional legislation and delivery bodies (Defra, MMO, IFCA) are thought to provide an appropriate and effective system of management (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> In addition to this, local management through the Reserve Working Group and Code of Conduct strengthen the management framework for fisheries in Lyme Bay.</p>	
<p>PI 3.1.2 Governance and Policy</p> <p><b>Consultation, roles and responsibilities:</b> The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> While there is strong management at different levels, it is thought that there is room to more clearly define roles and responsibilities of different organisations where there is overlap (i.e. enforcement at the 6nm boundary between MMO/IFCA; between IFCA Districts, and in terms of scientific advice and research undertaken between Cefas/IFCA) (Southall <i>et al.</i> 2013). In Lyme Bay Reserve there is, arguably, more clearly defined work and task sharing through the working group, which should allow it to score more highly than average.</p>	
<p><b>Additional requirements/recommendation:</b> In practice, Memoranda of Agreement or Understanding between organisations are often in place, and there is good communication in Lyme Bay specifically through the Working Group. There is always room to improve communication.</p>	
<p>PI 3.1.3 Governance and Policy</p> <p><b>Long term objectives:</b> The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Likely scoring: Pass</p>

**Why:**

At a national level, there are clear long term objectives for sustainable fisheries management under the Common Fisheries Policy, Marine Strategy Framework Directive; at a local level both IFCAs have similar objectives under the M&CAA (Southall *et al.* 2013). The vision of the Working Group for the Lyme Bay Reserve also reflects these.

**Additional requirements/recommendation:**

None.

PI 3.1.4 Governance and Policy

**Incentives for sustainable fishing:** The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.

Likely scoring:

Pass with condition

**Why:**

The Project Inshore assessment suggests that nationally, non-quota species not governed under Regulating Orders lack some of the incentives that “ownership” such as this provides (Southall *et al.* 2013). At a local level, the Code of Conduct constitutes a social incentive to increased sustainability, although the fishery is still “open access” which might discourage stewardship. The aspiration of the Working Group to develop a Lyme Bay brand offers the potential to provide economic incentives for sustainable fishing.

**Additional requirements/recommendation:**

Potentially, strengthening of the Code of Conduct, or ring-fencing of the fishery through permitting (via the IFCAs) or a Regulating Order could improve incentives as well as present the opportunity for adaptive management measures, implemented through conditions on permits. Development and marketing of a Lyme Bay brand may offer economic incentives.

## Fishery-specific management system

<p>PI 3.2.1 Fishery-specific management system</p> <p><b>Fishery-specific objectives:</b> The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>Although there are objectives implicit within the wider management system that are relevant to the fishery, there are no explicit fishery-specific objectives (Southall <i>et al.</i> 2013). The appropriate unit for management of the fishery may not be Lyme Bay, and is likely to cross the jurisdiction of various management bodies.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>It would be possible to devise fishery specific objectives within Lyme Bay and/or the Reserve itself, despite the more regional nature of the stock. The key here is understanding what is achievable within local management, which requires better understanding of how the Lyme Bay fishery affects the stock on a local level – something which should come out of the Plymouth Potting study.</p>	
<p>PI 3.2.2 Fishery-specific management system</p> <p><b>Decision-making processes:</b> The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>The lack of fishery-specific management in turn makes the decision-making process unclear (Southall <i>et al.</i> 2013); several competent authorities manage fisheries at different scales, although work to define sharing of responsibilities is ongoing at a MMO and IFCA level.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>At the local Lyme Bay level, there is good communication between stakeholders and management appears to work well together; however, there could be room to improve how this is made clear and codify it (in a local management plan, at a fishery level).</p>	
<p>PI 3.2.3 Fishery-specific management system</p> <p><b>Compliance and enforcement:</b> Monitoring, control and surveillance mechanisms ensure the fishery’s management measures are enforced and complied with</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b></p> <p>There is a strong monitoring, control and surveillance (MCS) system in place, with MMO and the two local IFCA’s being key organisations. The introduction of inshore VMS gold-plates the capacity to monitor compliance where appropriate.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>It will be important to ensure that the iVMS is properly integrated or joined up with existing MCS.</p>	

<p>PI 3.2.4 Fishery-specific management system</p> <p><b>Research plan:</b> The fishery has a research plan that addresses the information needs of management</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is relevant research into brown crab fisheries by Cefas and locally by IFCA – additionally, work is ongoing at ICES level through WGCRA and other initiatives (Southall <i>et al.</i> 2013). However, this is not under a cohesive research plan, but on an ad hoc basis. There is a potting study underway which should go some way to addressing the information needs and informing management measures.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Better coordination of ongoing monitoring and novel research into brown crab fisheries would be an asset. Although the stock is regional, efforts could nevertheless be made at a local level through the Working Group. There are obviously benefits to partner organisations resulting from closer working and coordination of research work.</p>	
<p>PI 3.2.5 Fishery-specific management system</p> <p><b>Monitoring and management performance evaluation:</b> There is a system for monitoring and evaluating the performance of the fishery specific management system against its objectives. There is effective and timely review of the fishery-specific management system</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is management of crab at a European level through ICES’ WGCRA, and nationally by Cefas (2011), but this is not a “system” as it remains fairly ad hoc (Southall <i>et al.</i> 2013), as does the fishery-specific management itself.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>This has to really happen at the level of the management system. Currently, this is international; if local management through permitting, Byelaws or a Regulating Order were brought in, there would be more local autonomy and management, and the scope for regular evaluation of that management.</p>	

# Lobster (*Homarus gammarus*), Potting

## Principle 1

### Outcome

<p>PI 1.1.1 <i>Outcome</i></p> <p><b>Stock status:</b> The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>	<p>Likely scoring: Fail (or Pass with condition)</p>
<p><b>Why:</b></p> <p>Recent Cefas assessments of the Western Channel lobster stock show that it is above the limit reference point – i.e. recruitment is not likely to be impaired (Cefas, 2011a), although stocks are probably below target <math>B_{msy}</math> levels (Southall <i>et al.</i>, 2013). This includes the Devon &amp; Severn IFCA District, but not the Southern District – this is assessed within the Southeast &amp; South Coast stock, which is thought to be less healthy (Cefas, 2011b). In reality, Lyme Bay stocks are not divided along administrative boundaries, even if management does differ between IFCA Districts.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Currently, Cefas assessments are the main basis for assessing the local stock. As such, it is difficult to synthesise a local assessment not split along IFCA boundaries– however, this would be possible with biometric data for lobsters within Lyme Bay. This would require coordination between both IFCAs and Cefas to collate relevant data from existing monitoring, or an independent scheme. The goal might be to determine whether the Lyme Bay lobster stock resembles the Western or Southeast (Cefas) units more closely, so that in future the assessment for one of these could be used as a proxy.</p> <p>Alternatively, the boundaries currently used to delineate the southern stock from the western channel stock could be moved to reflect the reality that Lyme Bay is within the same stock unit. This could benefit from further clarification from Cefas, and the Working Group could lobby for such a decision.</p>	
<p>PI 1.1.2 <i>Outcome</i></p> <p><b>Reference points:</b> Limit and target reference points are appropriate for the stock</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b></p> <p>Cefas reference points used to assess stock status are appropriate: target reference point is 35% spawning potential @ <math>F_0</math>; limit reference point is 15% (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Again, this relies on regional assessments undertaken by Cefas. The reference points used are deemed to be appropriate – no action needed. If a local assessment were to be done, it should follow the protocol used by Cefas.</p>	
<p>PI 1.1.3 <i>Outcome</i></p> <p><b>Stock rebuilding:</b> Where stock is depleted, there is evidence of stock rebuilding within a specified timeframe</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b></p> <p>Recent assessments by Cefas (2011a, 2011b) indicate that the stock is depleted as it is below target levels within the stock region corresponding to the Southern IFCA District.</p>	

However, there are no strategies to rebuild it that could reasonably be expected to succeed.

**Additional requirements/recommendation:**

At a Lyme Bay level, it is difficult to take action likely to have an effect on the level of the stock. Pot restrictions might help at a local level, but only if they reduce effort rather than cap it. Better understanding of how local stocks relate to the wider lobster stock regionally would be needed to help inform management measures, or a means of monitoring stock in Lyme Bay and feeding this information directly into management – through a management plan – in a timely way. IFCA permitting could incorporate evidence from IFCA surveys and the Potting Study (University of Plymouth) to more actively build stocks.

Pre-recruit surveys would provide evidence of local “health”, particularly if part of ongoing monitoring.

### Management

<p>PI 1.2.1 Management</p> <p><b>Harvest strategy:</b> There is a robust and precautionary harvest strategy in place</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b></p> <p>The main harvest strategy is the use of a MLS, in conjunction with other technical measures. However, these do not appear to be protecting the stock, given that it is below sustainable target levels in part of the area (Southall <i>et al.</i>, 2013). Pot limitation measures within the Reserve could be seen as an additional level of protection, but not without being tied to (and therefore adaptable to) the state of the stock. While there is a more precautionary 90 mm CL MLS in the Devon &amp; Severn IFCA District, it is not clear how enforcement of this might work within Lyme Bay, although a deeming clause within the proposed Devon &amp; Severn IFCA Permitting Byelaw is likely to help strengthen this.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>A better understanding of the Lyme Bay stocks couple with a basic management plan to allow changes to local management measures that would (and can be shown to) have an impact. However, operationally the level of effort reduction thought necessary to bring lobster stocks within target levels may not be achievable at a local or regional level (Southall <i>et al.</i>, 2013).</p>	
<p>PI 1.2.2 Management</p> <p><b>Harvest control rules and tools:</b> There are well defined and effective harvest control rules in place</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b></p> <p>Current technical measures (such as MLS) have been shown not to be effective in managing exploitation of the stock (Southall <i>et al.</i>, 2013). Within Lyme itself, the additional harvest control of pot limitations (via the Code of Conduct) could be seen as a check on increasing exploitation rates, but are not currently aimed at effort reduction (which is needed since the stock is not above target levels). As previously mentioned, the discrepancy between MLS across the two IFCA Districts is a potential enforcement issue, but also an area where management cannot be “well defined” in a Lyme Bay context.</p>	



**Additional requirements/recommendation:**

In terms of a more precautionary suite of harvest control rules, where stock is seen to be depleted, these rules need to be adaptive and respond in order to rebuild the stock. Better understanding of the local stock is a key component of this, but also harmonising harvest control rules within Lyme Bay is an area of discussion for the Working Group. IFCA permitting byelaws and/or a Regulating Order could incorporate harvest control rules.

## PI 1.2.3 Management

**Information and monitoring:** Relevant information is collected to support the harvest strategy

Likely scoring:  
Pass with  
condition

**Why:**

There is information available on sales (from MMO returns), effort (from MSAR Shellfish Returns) and Cefas also undertake port biosampling to support length frequency-based cohort analysis (Cefas, 2011a, 2011b). However, fishery data is not accurate enough to support well defined harvest control rules (Southall *et al.*, 2013).

**Additional requirements/recommendation:**

At a local level, better landings and effort data collection would help to address this gap. There is some descriptive analysis on potting fisheries by Devon & Severn IFCA (Clark, 2008), but this was a standalone report rather than part of ongoing monitoring. The Fully Documented Fishery project and iVMS provide the tools to address these information gaps if rolled out in the future, as will the University of Plymouth potting study underway.

## PI 1.2.4 Management

**Assessment of stock status:** There is an adequate assessment of the stock status

Likely scoring:  
Pass with  
condition

**Why:**

There is analytical assessment of stocks, and uncertainty is identified but it is not taken into account within the assessment (Southall *et al.*, 2013)

**Additional requirements/recommendation:**

Accounting for uncertainty within the assessment would increase the score – but this likely to be possible only as fishery data improves (see above). Liaison with Cefas to see how improvements at a local level could support assessments might be productive.

## Principle 2

### Retained species

<p>PI 2.1.1 Retained Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Main retained species (brown crab) is likely to be within biologically based limits (Southall <i>et al.</i>, 2013). Spider crab, as a minor retained species, are highly likely to be within limits (and are included on Cefas' under-utilised species list<sup>3</sup>).</p>	
<p><b>Additional requirements/recommendation:</b> The potting fishery is, strictly speaking, targeting both crab and lobster – so there are no “main” retained species (although if counted, crab is well within biological limits and not at risk from the lobster fishery).</p>	
<p>PI 2.1.2 Retained Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Technical measures for the conservation of crab (minimum landing size, ban on landing berried crab) in both IFCA Districts count towards a management strategy. The lobster fishery in Lyme is unlikely to hinder the recovery of crab stocks – the pot limitation contributes to this, too.</p>	
<p><b>Additional requirements/recommendation:</b> See assessment for crab (P1) as this is the main retained bycatch in this fishery. The status of brown crab stocks is good.</p>	
<p>PI 2.1.3 Retained Species</p> <p><b>Information/Monitoring:</b> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The combination of Regulation of Buyers &amp; Sellers &amp; shellfish returns data should be sufficient to detect any increased risk by the fishery on retained bycatch (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Any additional information on catch composition and effort for crab and lobster (together and individually) such as IFCA research and/or the inshore VMS, fully documented fisheries etc. will support information and monitoring of all elements of the catch.</p>	

<sup>3</sup> <http://cefas.defra.gov.uk/our-science/fisheries-information/under-utilised-species.aspx>

## Bycatch species

<p>PI 2.2.1 Bycatch Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Pot fisheries' key bycatch consists of shore crab, velvet and other swimming crab species – all of which are “low risk”; post capture survival is high, too, allowing non-target bycatch to be returned to the sea alive (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.2.2 Bycatch Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Although bycatch species are unlikely to be at risk from pot fisheries, there is not a clear strategy in place concerning bycatch. Undersized and non-target crustaceans do have protection from escape gaps which are compulsory within the Devon &amp; Severn IFCA District, and encouraged (through provision of funding) but not compulsory in the Southern IFCA District. This is a partial strategy, but could be completed by a code of conduct for the handling and return of bycatch that isn't wanted. The scoring in Southall <i>et al.</i> (2013) is principally related to the low risk that pot fisheries are known to present</p>	
<p><b>Additional requirements/recommendation:</b> It might be a good idea to consider including bycatch handling within the Code of Conduct.</p>	
<p>PI 2.2.3 Bycatch Species</p> <p><b>Information/Monitoring:</b> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is not very much information collected on non-target bycatch species, although the risk from this fishery is very low so the level of monitoring might be appropriate.</p>	
<p><b>Additional requirements/recommendation:</b> Any further information on the level and type of non-target bycatch would be useful.</p>	

## ETP species

<p>PI 2.3.1 ETP Species</p> <p><b>Outcome status:</b> The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is not likely to be a strong risk of harm to ETP species, and management under various regimes including Natura 2000 designations (SAC) should address risk of interaction between the fishery and ETP species. However, there is not data to assess rates of interaction.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Spatial data (from inshore VMS) is likely to provide better information to assess ETP interaction and confirm the level of risk the fishery presents. The Plymouth Potting study will contribute information about what constitutes as a sustainable level of potting intensity, which is important in understanding fishery impact on sensitive benthic habitats and species.</p>	
<p>PI 2.3.2 ETP Species</p> <p><b>Management strategy:</b> The fishery has in place precautionary management strategies designed to: meet national and international requirements; ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; ensure the fishery does not hinder recovery of ETP species; and minimize mortality of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There are some relevant management measures at a higher level regarding ETP species (through species and biodiversity action plans nationally, and as part of the SAC), but not a strategy that sees this directly implemented at a fishery level. However, the Risk Matrix starts to look at fishery level effects on ETP species and could form part of a management strategy.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>A strategy could be embedded in the Code of Conduct, or another voluntary good practice scheme – on a practical level, this could be documented training on how to avoid ETP interactions and reporting of any encounters. Monitoring is technically needed (at least, to score higher at MSC assessment) to see whether the strategy is being implemented and succeeding.</p>	
<p>PI 2.3.3 ETP Species</p> <p><b>Information/Monitoring:</b> Relevant information is collected to support the management of fishery impacts on ETP species, including: information for the development of the management strategy; information to assess the effectiveness of the management strategy; and information to determine the outcome status of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is some information on distribution of ETP species, and fisheries effort – but little linking the two (i.e. the frequency of interaction between the potting fishery and ETP species). So while there is broad understanding of likely impacts, there is not sufficient data for quantitative assessments.</p>	

**Additional requirements/recommendation:**

Improvements in fisheries data – and particularly spatial information – can definitely help here, but better understanding or monitoring of potting interactions with ETP species is the main thing lacking (see above).

## Habitats

### PI 2.4.1 Habitats

**Outcome status:** The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function

Likely scoring:  
Pass

**Why:**

Potting fisheries in general are thought to have a lesser and more local impact than many other gear types on habitat (Southall *et al.* 2013). A study by Eno *et al.* (2001) on Lyme Bay potting fisheries showed that there was little or no immediate impact on sensitive benthic species.

**Additional requirements/recommendation:**

None.

### PI 2.4.2 Habitats

**Management strategy:** There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types

Likely scoring:  
Pass

**Why:**

Where there is low interaction (as for potting fisheries) between gear and habitats, limited management is needed (Southall *et al.* 2013). The restriction on potting effort in Lyme is likely to be enough to satisfy requirements.

**Additional requirements/recommendation:**

Strengthening management by feeding in information from spatial monitoring (VMS) to condition monitoring assessments within the Reserve (as will be required within the SAC) would improve the strategy, as well as incorporating any recommendations from the University of Plymouth potting study.

### PI 2.4.3 Habitats

**Information/Monitoring:** Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.

Likely scoring:  
Pass

**Why:**

Good VMS data within the Lyme Bay Reserve should allow an unconditional pass. There is a potting study underway which should further improve the information available to support management of fishery impacts.

**Additional requirements/recommendation:**

This is dependent on the right information being collected and fed back into monitoring of habitat condition.

## Ecosystem

<p>PI 2.5.1 <i>Ecosystem</i>  <b>Outcome status:</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function</p>	<p>Likely scoring:  Pass</p>
<p><b>Why:</b>  Potting has a low habitat impact and is highly selective, with discards generally returned alive. There is little risk of damage to the wider ecosystem (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b>  None.</p>	
<p>PI 2.5.2 <i>Ecosystem</i>  <b>Management strategy:</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function</p>	<p>Likely scoring:  Pass</p>
<p><b>Why:</b>  There is management addressing ecosystem effects of fisheries on a national level, through MPA networks such as EMS and MCZ. Locally, IFCA Byelaws on pot construction (including escape gaps) further improve the selectivity of sizeable target species; sensitive habitat interaction is low and spatial monitoring (inshore VMS) is in place.</p>	
<p><b>Additional requirements/recommendation:</b>  None.</p>	
<p>PI 2.5.3 <i>Ecosystem</i>  <b>Information/Monitoring:</b> There is adequate knowledge of the impacts of the fishery on the ecosystem</p>	<p>Likely scoring:  Pass</p>
<p><b>Why:</b>  There is good information on ecosystem impacts of potting fisheries, including a study with a local component (Eno <i>et al.</i> 2001).</p>	
<p><b>Additional requirements/recommendation:</b>  Monitoring of impact could be improved by integrating catch and effort data with habitat data, which could be analysed to help monitor any changes in the ecosystem in conjunction with fishery changes. There is a potting study underway which should further improve understanding of ecosystem impacts.</p>	

## Principle 3

### Governance and policy

<p>PI 3.1.1 Governance and Policy</p> <p><b>Legal and/or customary framework:</b> The management system exists within an appropriate and effective legal and/or customary framework which ensures it: is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and incorporates an appropriate dispute resolution framework</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The framework of international (EU CFP), national and regional legislation and delivery bodies (Defra, MMO, IFCA) are thought to provide an appropriate and effective system of management (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> In addition to this, local management through the Reserve Working Group and Code of Conduct strengthen the management framework for fisheries in Lyme Bay.</p>	
<p>PI 3.1.2 Governance and Policy</p> <p><b>Consultation, roles and responsibilities:</b> The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> While there is strong management at different levels, it is thought that there is room to more clearly define roles and responsibilities of different organisations where there is overlap (i.e. enforcement at the 6nm boundary between MMO/IFCA; between IFCA Districts, and in terms of scientific advice and research undertaken between Cefas/IFCA) (Southall <i>et al.</i> 2013). In Lyme Bay Reserve there is, arguably, more clearly defined work and task sharing through the working group, which should allow it to score more highly than average.</p>	
<p><b>Additional requirements/recommendation:</b> In practice, Memoranda of Agreement or Understanding between organisations are often in place, and there is good communication in Lyme Bay specifically through the Working Group. There is always room to improve communication.</p>	
<p>PI 3.1.3 Governance and Policy</p> <p><b>Long term objectives:</b> The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> At a national level, there are clear long term objectives for sustainable fisheries management under the Common Fisheries Policy, Marine Strategy Framework Directive; at a local level both IFCA have similar objectives under the M&amp;CAA (Southall <i>et al.</i> 2013). The vision of the Working Group for the Lyme Bay Reserve also reflects these.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

<p>PI 3.1.4 Governance and Policy</p> <p><b>Incentives for sustainable fishing:</b> The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>The Project Inshore assessment suggests that nationally, non-quota species not governed under Regulating Orders lack some of the incentives that “ownership” such as this provides (Southall <i>et al.</i> 2013). At a local level, the Code of Conduct constitutes a social incentive to increased sustainability, although the fishery is still “open access” which might discourage stewardship. The aspiration of the Working Group to develop a Lyme Bay brand offers the potential to provide economic incentives for sustainable fishing.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Potentially, strengthening of the Code of Conduct, or ring-fencing of the fishery through permitting (via the IFCA) or a Regulating Order could improve incentives as well as present the opportunity for adaptive management measures, implemented through conditions on permits.</p>	

### Fishery-specific management system

<p>PI 3.2.1 Fishery-specific management system</p> <p><b>Fishery-specific objectives:</b> The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>Although there are objectives implicit within the wider management system that are relevant to the fishery, there are no explicit fishery-specific objectives (Southall <i>et al.</i> 2013). The appropriate unit for management of the fishery may not be Lyme Bay, and is likely to cross the jurisdiction of various management bodies.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>It would be possible to devise fishery specific objectives within Lyme Bay and/or the Reserve itself, although this is probably not practical given the localised element of management, and the more regional nature of the stock.</p>	
<p>PI 3.2.2 Fishery-specific management system</p> <p><b>Decision-making processes:</b> The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>The lack of fishery-specific management in turn makes the decision-making process unclear (Southall <i>et al.</i> 2013); several competent authorities manage fisheries at different scales, although work to define sharing of responsibilities is ongoing at a MMO and IFCA level.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>At the local Lyme Bay level, there is good communication between stakeholders and management appears to work well together; however, there could be room to improve how this is made clear and codify it (in a management plan, at a fishery level).</p>	



<p>PI 3.2.3 Fishery-specific management system  <b>Compliance and enforcement:</b> Monitoring, control and surveillance mechanisms ensure the fishery’s management measures are enforced and complied with</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  There is a strong monitoring, control and surveillance (MCS) system in place, with MMO and the two local IFCAs being key organisations. The introduction of inshore VMS gold-plates the capacity to monitor compliance where appropriate.</p>	
<p><b>Additional requirements/recommendation:</b>                  It will be important to ensure that the iVMS is properly integrated or joined up with existing MCS.</p>	
<p>PI 3.2.4 Fishery-specific management system  <b>Research plan:</b> The fishery has a research plan that addresses the information needs of management</p>	<p>Likely scoring:                  Pass with condition</p>
<p><b>Why:</b>                  There is relevant research into lobster fisheries by Cefas and locally by IFCAs (Southall <i>et al.</i> 2013). However, this is not under a cohesive research plan, but on an ad hoc basis. There is a potting study underway which should go some way to addressing the information needs and informing management measures.</p>	
<p><b>Additional requirements/recommendation:</b>                  Better coordination of ongoing monitoring and novel research into lobster fisheries would be an asset. Although the stock is regional, efforts could nevertheless be made at a local level through the Working Group. There are obviously benefits to partner organisations resulting from closer working and coordination of research work.</p>	
<p>PI 3.2.5 Fishery-specific management system  <b>Monitoring and management performance evaluation:</b> There is a system for monitoring and evaluating the performance of the fishery specific management system against its objectives. There is effective and timely review of the fishery-specific management system</p>	<p>Likely scoring:                  Pass with condition</p>
<p><b>Why:</b>                  There is management of lobster at a European level, and monitoring nationally by Cefas (2011a, 2011b), but this is not a “system” as it remains fairly ad hoc (Southall <i>et al.</i> 2013), as does the fishery-specific management itself.</p>	
<p><b>Additional requirements/recommendation:</b>                  This has to really happen at the level of the management system. Currently, this is international; if local management through permitting, Byelaws or a Regulating Order were brought in, there would be more local autonomy and management, and the scope for regular evaluation of that management.</p>	

# Whelk (*Buccinum undatum*), Potting

## Principle 1

### Outcome

<p>PI 1.1.1 <i>Outcome</i></p> <p><b>Stock status:</b> The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>	<p>Likely scoring: Fail (RBF)</p>
<p><b>Why:</b> There are currently no stock assessments for whelk, at either a national or local level (although Cefas is starting a research programme (MMO, 2012). The Project Inshore assessment applied the Risk Based Framework in assessing stock status, and concluded that the whelk fishery posed a high risk to the species’ productivity (Southall <i>et al.</i>, 2013). This is partly due to the reproductive biology of whelks, which makes them vulnerable to recruitment overfishing (Lawler and Vause, 2009). This is a precautionary stance, but highlights the need for information as much as the likelihood that the stock is depleted.</p>	
<p><b>Additional requirements/recommendation:</b> Further information on the current status stock and how it relates to fishing effort is needed. This might be in the form of biological survey data and/or landings and effort data (for which the Fully Documented Fishery Project could be of use); there are discussions ongoing with Cefas about the use of this data in their assessments. Whelk is a particularly important commercial fishery, so there is a strong need to ensure it is being sustainably harvested.</p>	
<p>PI 1.1.2 <i>Outcome</i></p> <p><b>Reference points:</b> Limit and target reference points are appropriate for the stock</p>	<p>Likely scoring: Pass (RBF)</p>
<p><b>Why:</b> This is not a very helpful metric for this fishery, as no stock assessments are made. The score (80) is given automatically for this PI when the Risk Based Framework is used for 1.1.1 (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> When information becomes available to conduct a stock assessment, appropriate reference points should be used. It would be advisable to consult Cefas on this (an assessment of Sussex whelk fisheries shows a method for stock assessment – see Lawler and Vause (2009)).</p>	
<p>PI 1.1.3 <i>Outcome</i></p> <p><b>Stock rebuilding:</b> Where stock is depleted, there is evidence of stock rebuilding within a specified timeframe</p>	<p>Likely scoring: Not assessed</p>
<p><b>Why:</b> As there is no stock assessment, this PI is not assessed as per the MSC Certification Requirements (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> As for other fisheries, a mechanism for stock rebuilding (where depleted) would require monitoring of stock status which must feed into management measures or harvest control rules. These might include potting restrictions, a different MLS or a combination of these or</p>	

other tools.

## Management

<p>PI 1.2.1 Management  <b>Harvest strategy:</b> There is a robust and precautionary harvest strategy in place</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b>                  The main harvest strategy is the use of a MLS, which is set at a European Level (EC 850/98) as 45 mm shell length. It has been suggested that this is below the size at which most whelks become sexually mature (MMO, 2012). Further, there is no evidence that this is suitable on its own as a means of keeping harvest levels sustainable. It is probably neither robust nor precautionary.</p>	
<p><b>Additional requirements/recommendation:</b>                  A better understanding of the Lyme Bay stocks coupled with a basic management plan to allow changes to local management measures that would (and can be shown to) have an impact. This requires better biological and fisheries data on whelk in Lyme Bay. Studies have shown that size at maturity varies regionally (MMO, 2012), which would support a Lyme Bay (or regional/inshore) MLS suited to the characteristics of the local stock. Cefas has been undertaking sampling of whelks as part of a Defra funded project in order to support development of national and local MLS (MMO, 2012). Additionally, Devon &amp; Severn IFCA have been undertaking research locally on the size at sexual maturity of whelks, and seasonality of spawning. This is intended to feed into management of whelks and to help develop suitable management measures. Results indicate an increase in MLS would be beneficial; this was also the finding of the Cefas report.</p>	
<p>PI 1.2.2 Management  <b>Harvest control rules and tools:</b> There are well defined and effective harvest control rules in place</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b>                  Current technical measures (such as MLS) may not be effective in managing exploitation of the stock (Southall <i>et al.</i>, 2013). Within Lyme itself, the additional harvest control of pot limitations (via the Code of Conduct) could be seen as a check on increasing exploitation rates, but is not currently aimed at effort reduction. Without better understanding of stock status, it is not possible to know how effective harvest control rules are.</p>	
<p><b>Additional requirements/recommendation:</b>                  Harvest control rules are needed which are adaptive and respond to stock status in order to rebuild where stock is seen to be depleted. Better understanding of the local stock is a key component of this, but also harmonising harvest control rules within Lyme Bay is an area of discussion for the Working Group. IFCA permitting and/or a Regulating Order could incorporate harvest control rules.</p>	
<p>PI 1.2.3 Management  <b>Information and monitoring:</b> Relevant information is collected to support the harvest strategy</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b>                  There is information available on sales (from MMO returns) and effort (from MSAR Shellfish Returns), but a lack of any data to support a stock assessment. Additionally, fishery data is not accurate enough to support well defined harvest control rules (Southall <i>et al.</i>, 2013).</p>	

**Additional requirements/recommendation:**

In addition to biological data (previously discussed), better landings and effort data collection would help to address this gap. The Fully Documented Fishery project and iVMS provide the tools to address these information gaps if rolled out in the future.

PI 1.2.4 Management

**Assessment of stock status:** There is an adequate assessment of the stock status

Likely scoring:  
Pass (RBF)

**Why:**

There is no assessment of stock status – the pass here is automatic as per the MSC Certification Requirements (MSC, 2013).

**Additional requirements/recommendation:**

See previous comments for recommendations on stock assessment.

## Principle 2

### Retained species

<p>PI 2.1.1 Retained Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	<p>Likely scoring: Pass (RBF, PSA)</p>
<p><b>Why:</b></p> <p>There was little readily available information on bycatch in the local whelk fishery, although main retained species is thought to be Spider crab (<i>Maja squinado</i>). These are present in landings according to MMO data for the area, and Spider crab species are known to be caught in whelk fisheries elsewhere (Lawler and Vause, 2009) so although the quantity within the catch may not qualify it as a “main species” taking a precautionary approach means it needs to be considered.</p> <p>There was conflicting information to inform scoring: the Project Inshore Report (Southall <i>et al.</i>, 2013) suggested a score of &lt;60 for Spider crab as retained bycatch, but the species appears on Cefas’ <a href="#">under-utilised species list</a>, and doesn’t appear to be at risk. We therefore undertook a MSC “Product Susceptibility Analysis” under the Risk Based Framework (MSC, 2013) which yielded a score of &gt;80.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Better understanding of the bycatch composition of whelk target fisheries would be very helpful for future analysis. For main retained species, this information may come from the Fully Documented Fisheries work.</p>	
<p>PI 2.1.2 Retained Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>Technical measures are the principal management strategy for the conservation of spider crab, with minimum landing sizes of 130mm and 120mm CL for males and females respectively. This may not be an effective management measure, depending on the local size at maturity for Spider crab; this has been estimated in Irish stocks as 110mm CL50 (the size at which 50% of individuals are sexually mature) for females (Fahy, 2001). Estimates for Spanish waters were ~ 120mm; Channel waters are likely to fall somewhere in between this as there is a latitudinal relationship (Gonzalez-Gurriaran <i>et al.</i>, 1995). This means that some proportion of the stock will not have the opportunity to spawn before capture. However, exploitation levels are low. Within Lyme Bay, the pot limitation provides a cap on effort that could be viewed as a partial strategy. Additionally, Devon &amp; Severn IFCA are planning to increase the MLS for female spider crab to 130mm.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Improvements in monitoring of catch composition would help managers assess whether additional measures are needed (in the context of the whelk fishery, at least); beyond this, any research on the reproductive biology of spider crab would help determine the suitability of the MLS in Lyme Bay.</p>	

PI 2.1.3 Retained Species <b>Information/Monitoring:</b> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	Likely scoring: Pass with condition
<b>Why:</b> Regulation of Buyers & Sellers & shellfish returns data should help to detect any increased risk by the fishery on retained bycatch (Southall <i>et al.</i> , 2013); however there is a need for better understanding of the nature and extent of bycatch within the fishery which is less well studied than the crab and lobster fishery.	
<b>Additional requirements/recommendation:</b> Any additional information on catch composition in the whelk fishery - such as IFCA research and/or the inshore VMS, fully documented fisheries etc. will support information and monitoring of all elements of the catch.	

### Bycatch species

PI 2.2.1 Bycatch Species <b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	Likely scoring: Pass
<b>Why:</b> Whelk potting fisheries' key bycatch consists of shore crab, hermit and other swimming crab species – all of which are “low risk”; post capture survival is high, too, allowing non-target bycatch to be returned to the sea alive (Southall <i>et al.</i> , 2013).	
<b>Additional requirements/recommendation:</b> None.	
PI 2.2.2 Bycatch Species <b>Management strategy:</b> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	Likely scoring: Pass
<b>Why:</b> Although bycatch species are unlikely to be at risk from pot fisheries, there is not a clear strategy in place concerning bycatch. The scoring in Southall <i>et al.</i> (2013) is related to the low risk that pot fisheries are known to present	
<b>Additional requirements/recommendation:</b> It might be a good idea to consider including bycatch handling within the Code of Conduct.	
PI 2.2.3 Bycatch Species <b>Information/Monitoring:</b> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	Likely scoring: Pass
<b>Why:</b> There is not very much information collected on non-target bycatch species, although the risk from this fishery is very low so the level of monitoring might be appropriate.	
<b>Additional requirements/recommendation:</b> Any further information on the level and type of non-target bycatch would be useful.	

## ETP species

<p>PI 2.3.1 ETP Species</p> <p><b>Outcome status:</b> The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There is not likely to be a strong risk of harm to ETP species, and management under various regimes including Natura 2000 designations (SAC) should address risk of interaction between the fishery and ETP species. However, there is not data to assess rates of interaction.</p>	
<p><b>Additional requirements/recommendation:</b> Spatial data (from inshore VMS) is likely to provide better information to assess ETP interaction and confirm the level of risk the fishery presents.</p>	
<p>PI 2.3.2 ETP Species</p> <p><b>Management strategy:</b> The fishery has in place precautionary management strategies designed to: meet national and international requirements; ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; ensure the fishery does not hinder recovery of ETP species; and minimize mortality of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There are some relevant management measures at a higher level regarding ETP species (through species and biodiversity action plans nationally, and as part of the SAC), but not a strategy that sees this directly implemented at a fishery level. However, the Risk Matrix starts to look at fishery level effects on ETP species and could form part of a management strategy.</p>	
<p><b>Additional requirements/recommendation:</b> A strategy could be embedded in the Code of Conduct, or another voluntary good practice scheme – on a practical level, this could be documented training on how to avoid ETP interactions and reporting of any encounters. Monitoring is technically needed (at least, to score higher at MSC assessment) to see whether the strategy is being implemented and succeeding.</p>	
<p>PI 2.3.3 ETP Species</p> <p><b>Information/Monitoring:</b> Relevant information is collected to support the management of fishery impacts on ETP species, including: information for the development of the management strategy; information to assess the effectiveness of the management strategy; and information to determine the outcome status of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There is some information on distribution of ETP species, and fisheries effort – but little linking the two (i.e. the frequency of interaction between the potting fishery and ETP species). So while there is broad understanding of likely impacts, there is not sufficient data for quantitative assessments.</p>	
<p><b>Additional requirements/recommendation:</b> Improvements in fisheries data – and particularly spatial information – can definitely help here, but better understanding or monitoring of potting interactions with ETP species is the main thing lacking (see above).</p>	

## Habitats

<p>PI 2.4.1 <i>Habitats</i>  <b>Outcome status:</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Potting fisheries in general are thought to have a lesser and more local impact than many other gear types on habitat (Southall <i>et al.</i> 2013). A study by Eno <i>et al.</i> (2001) on Lyme Bay potting fisheries showed that there was little or no immediate impact on sensitive benthic species.</p>	
<p><b>Additional requirements/recommendation:</b>                  None.</p>	
<p>PI 2.4.2 <i>Habitats</i>  <b>Management strategy:</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Where there is low interaction (as for potting fisheries) between gear and habitats, limited management is needed (Southall <i>et al.</i> 2013). The restriction on potting effort in Lyme is likely to be enough to satisfy requirements.</p>	
<p><b>Additional requirements/recommendation:</b>                  Strengthening management by feeding in information from spatial monitoring (VMS) to condition monitoring assessments within the Reserve (as will be required within the SAC) would improve the strategy, as well as incorporating any recommendations from the University of Plymouth potting study.</p>	
<p>PI 2.4.3 <i>Habitats</i>  <b>Information/Monitoring:</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Good VMS data within the Lyme Bay Reserve should allow an unconditional pass. There is a potting study underway which should further improve the information available to support management of fishery impacts.</p>	
<p><b>Additional requirements/recommendation:</b>                  This is dependent on the right information being collected and fed back into monitoring of habitat condition.</p>	



## Ecosystem

<p>PI 2.5.1 <i>Ecosystem</i>  <b>Outcome status:</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Potting has a low habitat impact and is highly selective, with discards generally returned alive. There is little risk of damage to the wider ecosystem (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  None.</p>	
<p>PI 2.5.2 <i>Ecosystem</i>  <b>Management strategy:</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  There is management addressing ecosystem effects of fisheries on a national level, through MPA networks such as EMS and MCZ. Locally, IFCA Byelaws on pot construction (including escape gaps) further improve the selectivity of sizeable target species; sensitive habitat interaction is low and spatial monitoring (inshore VMS) is in place.</p>	
<p><b>Additional requirements/recommendation:</b>                  None.</p>	
<p>PI 2.5.3 <i>Ecosystem</i>  <b>Information/Monitoring:</b> There is adequate knowledge of the impacts of the fishery on the ecosystem</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  There is good information on ecosystem impacts of potting fisheries, including a study with a local component (Eno <i>et al.</i> 2001).</p>	
<p><b>Additional requirements/recommendation:</b>                  Monitoring of impact could be improved by integrating catch and effort data with habitat data, which could be analysed to help monitor any changes in the ecosystem in conjunction with fishery changes. There is a potting study underway which should further improve understanding of ecosystem impacts.</p>	

## Principle 3

### Governance and policy

<p>PI 3.1.1 Governance and Policy</p> <p><b>Legal and/or customary framework:</b> The management system exists within an appropriate and effective legal and/or customary framework which ensures it: is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and incorporates an appropriate dispute resolution framework</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The framework of international (EU CFP), national and regional legislation and delivery bodies (Defra, MMO, IFCA) are thought to provide an appropriate and effective system of management (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> In addition to this, local management through the Reserve Working Group and Code of Conduct strengthen the management framework for fisheries in Lyme Bay.</p>	
<p>PI 3.1.2 Governance and Policy</p> <p><b>Consultation, roles and responsibilities:</b> The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> While there is strong management at different levels, it is thought that there is room to more clearly define roles and responsibilities of different organisations where there is overlap (i.e. enforcement at the 6nm boundary between MMO/IFCA; between IFCA Districts, and in terms of scientific advice and research undertaken between Cefas/IFCA) (Southall <i>et al.</i> 2013). In Lyme Bay Reserve there is, arguably, more clearly defined work and task sharing through the working group, which should allow it to score more highly than average.</p>	
<p><b>Additional requirements/recommendation:</b> In practice, Memoranda of Agreement or Understanding between organisations are often in place, and there is good communication in Lyme Bay specifically through the Working Group. There is always room to improve communication.</p>	
<p>PI 3.1.3 Governance and Policy</p> <p><b>Long term objectives:</b> The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> At a national level, there are clear long term objectives for sustainable fisheries management under the Common Fisheries Policy, Marine Strategy Framework Directive; at a local level both IFCA have similar objectives under the M&amp;CAA (Southall <i>et al.</i> 2013). The vision of the Working Group for the Lyme Bay Reserve also reflects these.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

<p>PI 3.1.4 Governance and Policy  <b>Incentives for sustainable fishing:</b> The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.</p>	<p>Likely scoring:                  Pass with condition</p>
<p><b>Why:</b>                  The Project Inshore assessment suggests that nationally, non-quota species not governed under Regulating Orders lack some of the incentives that “ownership” such as this provides (Southall <i>et al.</i> 2013). At a local level, the Code of Conduct constitutes a social incentive to increased sustainability, although the fishery is still “open access” which might discourage stewardship.</p>	
<p><b>Additional requirements/recommendation:</b>                  Potentially, strengthening of the Code of Conduct, or ring-fencing of the fishery through permitting (via the IFCA’s) or a Regulating Order could improve incentives as well as present the opportunity for adaptive management measures, implemented through conditions on permits. Additionally, branding could create economic incentives.</p>	

### Fishery-specific management system

<p>PI 3.2.1 Fishery-specific management system  <b>Fishery-specific objectives:</b> The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</p>	<p>Likely scoring:                  Fail</p>
<p><b>Why:</b>                  Although there are objectives implicit within the wider management system that are relevant to the fishery, there are no fishery-specific objectives and no relevant byelaws, which mean it falls short under this PI (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  It would be possible to devise fishery specific objectives within Lyme Bay and/or the Reserve itself. This is more practical for whelks than crab and lobster, as whelk stocks are not thought to migrate great distances but are relatively locally associated (Hancock, 1967). This means that the benefits (as well as the inconvenience of any additional management from a fisher’s perspective) would be enjoyed locally.</p>	
<p>PI 3.2.2 Fishery-specific management system  <b>Decision-making processes:</b> The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives</p>	<p>Likely scoring:                  Pass with condition</p>
<p><b>Why:</b>                  The lack of fishery-specific management in turn makes the decision-making process unclear (Southall <i>et al.</i> 2013); several competent authorities manage fisheries at different scales, although work to define sharing of responsibilities is ongoing at a MMO and IFCA level.</p>	
<p><b>Additional requirements/recommendation:</b>                  At the local Lyme Bay level, there is good communication between stakeholders and management appears to work well together; however, there could be room to improve how this is made clear and codify it (in a management plan, at a fishery level).</p>	

<p>I 3.2.3 Fishery-specific management system  <b>Compliance and enforcement:</b> Monitoring, control and surveillance mechanisms ensure the fishery’s management measures are enforced and complied with</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  There is a strong monitoring, control and surveillance (MCS) system in place, with MMO and the two local IFCA’s being key organisations. The introduction of inshore VMS gold-plates the capacity to monitor compliance where appropriate.</p>	
<p><b>Additional requirements/recommendation:</b>                  It will be important to ensure that the inshore VMS is properly integrated or joined up with existing MCS.</p>	
<p>PI 3.2.4 Fishery-specific management system  <b>Research plan:</b> The fishery has a research plan that addresses the information needs of management</p>	<p>Likely scoring:                  Fail</p>
<p><b>Why:</b>                  There is some research into the whelk fishery underway by Cefas (MMO, 2012), but this is fairly recent and not yet at the stage where the results have been actioned. Similarly, work by Devon &amp; Severn IFCA is likely to feed into management measures for whelk but was not available at the time of assessment.</p>	
<p><b>Additional requirements/recommendation:</b>                  The current score (given in the absence of the new research) is likely to improve if a re-assessment were to be taken in a year’s time. Given the local nature of whelk stocks and their importance to the local fishing economy, this fishery in particular would benefit from a Lyme Bay research plan to continue and build on the work started by Cefas and Devon &amp; Severn IFCA.</p>	
<p>PI 3.2.5 Fishery-specific management system  <b>Monitoring and management performance evaluation:</b> There is a system for monitoring and evaluating the performance of the fishery specific management system against its objectives. There is effective and timely review of the fishery-specific management system</p>	<p>Likely scoring:                  Fail</p>
<p><b>Why:</b>                  While the general management framework is regularly evaluated (for example, the IFCA’s report annually on performance) there is as yet no fishery specific management system. There are byelaw reviews underway by local IFCA’s, and the aforementioned Cefas work to determine maturity of whelk stocks is aimed at informing local (and national management); there is no doubt that the mechanisms exist for this advice to be acted on, but the lack of current measures constitutes a failure under this PI.</p>	
<p><b>Additional requirements/recommendation:</b>                  Consider a management plan for the whelk fishery (see 3.2.1, above). This could be produced at a Working Group (Lyme Bay) level, although is likely to require involvement of management bodies when it comes to implementing management – through byelaws or permitting, for example – that would have impact at the fishery level. Since any statutory measures (and indeed any measures that aim to be effective) require an evidence base, research is clearly an important first step in this regard.</p>	

# Sole (*Solea solea*), Netting (gill, trammel, drift)

## Principle 1

### Outcome

<p>PI 1.1.1 <i>Outcome</i></p> <p><b>Stock status:</b> The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> ICES stock assessments are undertaken for sole, and abundance estimates indicate that stock is likely to be above any limit or target reference point; fishing mortality has been below <math>F_{msy}</math> for several years (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Stock assessment of this species is currently undertaken at an international level, and it is unlikely that local action could significantly add to this given the regional nature of this stock.</p>	
<p>PI 1.1.2 <i>Outcome</i></p> <p><b>Reference points:</b> Limit and target reference points are appropriate for the stock</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> Reference points are used for the purposes of stock assessment, although they are not explicitly tied into management of the stock (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> There is not a clear action for the Working Group on this PI, given that stock management is undertaken by ICES.</p>	
<p>PI 1.1.3 <i>Outcome</i></p> <p><b>Stock rebuilding:</b> Where stock is depleted, there is evidence of stock rebuilding within a specified timeframe</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The stock is not currently depleted, but where it has previously been, rebuilding has been successful (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None required.</p>	

## Management

<p>PI 1.2.1 Management</p> <p><b>Harvest strategy:</b> There is a robust and precautionary harvest strategy in place</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The harvest strategy is administered at a European level and includes technical measures (including use of a MLS, (EC 850/98) at 24 mm length) and effort control through use of annual TAC limits (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None required.</p>	
<p>PI 1.2.2 Management</p> <p><b>Harvest control rules and tools:</b> There are well defined and effective harvest control rules in place</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> Harvest control rules are well defined (MLS, TAC), but currently they are not linked to the stock status explicitly – i.e. exploitation rate is not necessarily reduced as the limit reference point is reached (Southall <i>et al.</i>, 2013). This is needed to meet the definition of “effective” under the MSC Criteria (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> There is not a clear action for the Working Group on this PI, given that stock management is undertaken by ICES.</p>	
<p>PI 1.2.3 Management</p> <p><b>Information and monitoring:</b> Relevant information is collected to support the harvest strategy</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is good information available on fishery removals (e.g. MMO landings, sales records) and biological survey data on stock structure, productivity and abundance. Data is accurate enough to support well defined harvest control rules (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> While no action is required, Lyme Bay data from the Fully Documented Fishery scheme could theoretically further improve supporting information.</p>	
<p>PI 1.2.4 Management</p> <p><b>Assessment of stock status:</b> There is an adequate assessment of the stock status</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is a comprehensive stock assessment which is appropriate to the stock, evaluates stock status against references points and is subject to peer review through the ICES Working Group (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None required.</p>	

## Principle 2

### Retained species

<p>PI 2.1.1 Retained Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There was little readily available information on bycatch in the sole static netting fisheries, although main retained species are likely to be other demersal fish such as sole, bass, skates &amp; rays, cod, ling, pollack, pouting and others. Spider crabs are also caught in trammel nets. Generally, these retained species are also viewed as target species, given the mixed nature of the fishery. Most of the species are likely to be within biological limits, and have varying degrees of management measures in place.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Better understanding of the bycatch composition of sole target fisheries would be very helpful for future analysis. For main retained species, this information may come from the Fully Documented Fisheries work. The goal is to be able to demonstrate that the fishery does not adversely impact the stocks of any retained species.</p>	
<p>PI 2.1.2 Retained Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There are management measures (comprising at least a partial strategy) for most retained species. Some – including pouting, grey mullet, red gurnard, flounder and dab – have no strategy, and would not meet the minimum required to pass. However, these are present as a very small (sub 0.1% by weight) proportion of landings according to MMO data for the Lyme Bay fishery. This means they are not likely to count as a “main” species (&gt;5% of catch), although it is noted that not all landings may be captured by RBS records.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>There is definitely scope for improving the understanding of bycatch so as to ensure that appropriate management could be put in place if necessary. The Fully Documented Fishery project would be a means to do this; once the key species are identified, the need for additional management would follow on from this.</p>	
<p>PI 2.1.3 Retained Species</p> <p><b>Information/Monitoring:</b> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>Regulation of Buyers &amp; Sellers &amp; shellfish returns data should help to detect any increased risk by the fishery on retained bycatch (Southall <i>et al.</i>, 2013); however there is a need for better understanding of the nature and extent of bycatch within the fishery, specifically.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Any additional information on catch composition in the fishery - such as IFCA research and/or the inshore VMS, fully documented fisheries etc. will support information and monitoring of all elements of the catch.</p>	

<p>PI 2.2.1 Bycatch Species</p> <p><b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> A few species including dragonet, starry ray and nursehound have been recorded in set net fisheries and the latter of these (as the most vulnerable) scores medium risk under the Risk Based Framework (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Lyme Bay specific information on non-retained bycatch may not be captured by the Fully Documented Fishery scheme, in which case some data collection or reporting of these species would be of value. It might be that there are no bycaught species that are not retained and landed, or the proportion is negligible, but there is currently no data to support this. Cefas' current research on the Discards Ban may provide much of this information, and should be followed closely.</p>	

### Bycatch species

<p>PI 2.2.2 Bycatch Species</p> <p><b>Management strategy:</b> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There is not a clear strategy in place concerning bycatch, although the IFCA's have a general duty to manage fisheries sustainably (which loosely counts as a partial strategy), in practice it's too early for implementation of this in practice, and the lack of clear information regarding bycatch composition hinders the development of meaningful management.</p>	
<p><b>Additional requirements/recommendation:</b> While both IFCA's are likely to address bycatch at some stage, in practice this is a lower priority than many immediate work streams. It might be a good idea to consider including bycatch handling within the Code of Conduct, in fairly general terms; however, better information is probably a priority in the first instance.</p>	
<p>PI 2.2.3 Bycatch Species</p> <p><b>Information/Monitoring:</b> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There is not very much information collected on non-target bycatch species, and what is available is qualitative (i.e. a general understanding of typical species caught). This is only just adequate to support a partial bycatch strategy (even if one is not currently in place) (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Any further information on the level and type of non-target bycatch would be useful.</p>	



## ETP species

<p>PI 2.3.1 ETP Species</p> <p><b>Outcome status:</b> The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is not likely to be a strong risk of harm to ETP species, and management under various regimes including Natura 2000 designations (SAC) should address risk of interaction between the fishery and ETP species (which may include birds, cetaceans and seals). However, there is not data to assess rates of interaction.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Spatial data (from inshore VMS) is likely to provide better information to assess ETP interaction and confirm the level of risk the fishery presents.</p>	
<p>PI 2.3.2 ETP Species</p> <p><b>Management strategy:</b> The fishery has in place precautionary management strategies designed to: meet national and international requirements; ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; ensure the fishery does not hinder recovery of ETP species; and minimize mortality of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There are some relevant management measures at a higher level regarding ETP species (through species and biodiversity action plans nationally, and as part of the SAC), but not a strategy that sees this directly implemented at a fishery level. However, the Risk Matrix starts to look at fishery level effects on ETP species and could form part of a management strategy.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>A strategy could be embedded in the Code of Conduct, or another voluntary good practice scheme – on a practical level, this could be documented training on how to avoid ETP interactions and reporting of any encounters. Monitoring is technically needed (at least, to score higher at MSC assessment) to see whether the strategy is being implemented and succeeding.</p>	
<p>PI 2.3.3 ETP Species</p> <p><b>Information/Monitoring:</b> Relevant information is collected to support the management of fishery impacts on ETP species, including: information for the development of the management strategy; information to assess the effectiveness of the management strategy; and information to determine the outcome status of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There is some information on distribution of ETP species, and fisheries effort – but little linking the two (i.e. the frequency of interaction between the netting fishery and ETP species). So while there is broad understanding of likely impacts, there is not sufficient data for quantitative assessments.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Improvements in fisheries data – and particularly spatial information, via inshore VMS – can definitely help here, but better understanding or monitoring of interactions with ETP species is the main thing lacking (see above).</p>	

## Habitats

<p>PI 2.4.1 <i>Habitats</i></p> <p><b>Outcome status:</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b></p> <p>Nets are very lightweight, and have little contact with (and impact on) the seabed. Anchors are used to hold set nets in place (drift nets by definition are not attached in this way), but the level of interaction is generally understood to be very low and MSC certified gill, trammel and drift net fisheries consistently score over SG80 (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>None.</p>	
<p>PI 2.4.2 <i>Habitats</i></p> <p><b>Management strategy:</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b></p> <p>Where there is low interaction (as for netting fisheries) between gear and habitats, limited management is needed (Southall <i>et al.</i> 2013). The voluntary restriction on netting effort in Lyme is likely to be enough to satisfy requirements.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Strengthening management by feeding in information from spatial monitoring (VMS) to condition monitoring assessments within the Reserve (as will be required within the SAC) would improve the strategy.</p>	
<p>PI 2.4.3 <i>Habitats</i></p> <p><b>Information/Monitoring:</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b></p> <p>Good VMS data within the Lyme Bay Reserve should allow an unconditional pass, providing information on temporal and spatial interaction between fisheries and habitat.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>This is dependent on the right information being collected and fed back into monitoring of habitat condition.</p>	

## Ecosystem

<p>PI 2.5.1 <i>Ecosystem</i></p> <p><b>Outcome status:</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Netting has a low habitat impact and is relatively selective, with bycatch (retained and non-retained) the principal interaction – which is accounted for under P2.1 – 2.3. There is little risk of damage to the wider ecosystem (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.5.2 <i>Ecosystem</i></p> <p><b>Management strategy:</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is management addressing ecosystem effects of fisheries on a national level, through MPA networks such as EMS and MCZ (Southall <i>et al.</i> 2013). Locally, IFCA Byelaws on net construction further improve the selectivity of sizeable target species; permitting schemes (Devon and Severn only) will also limit intensity and therefore local impact. Sensitive habitat interaction is low and spatial monitoring (inshore VMS) is or will soon be in place.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.5.3 <i>Ecosystem</i></p> <p><b>Information/Monitoring:</b> There is adequate knowledge of the impacts of the fishery on the ecosystem</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is good information on ecosystem impacts of fisheries, with ongoing research programmes and monitoring at a national and international level (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Locally, understanding of ETP interactions and bycatch composition (both considered elsewhere) would improve the specificity of management within Lyme Bay.</p>	

## Principle 3

### Governance and policy

<p>PI 3.1.1 Governance and Policy</p> <p><b>Legal and/or customary framework:</b> The management system exists within an appropriate and effective legal and/or customary framework which ensures it: is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and incorporates an appropriate dispute resolution framework</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The framework of international (EU CFP), national and regional legislation and delivery bodies (Defra, MMO, IFCAs) are thought to provide an appropriate and effective system of management (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> In addition to this, local management through the Reserve Working Group and Code of Conduct strengthen the management framework for fisheries in Lyme Bay.</p>	
<p>PI 3.1.2 Governance and Policy</p> <p><b>Consultation, roles and responsibilities:</b> The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> While there is strong management at different levels, it is thought that there is room to more clearly define roles and responsibilities of different organisations where there is overlap (i.e. enforcement at the 6nm boundary between MMO/IFCA; between IFCA Districts, and in terms of scientific advice and research undertaken between Cefas/IFCA) (Southall <i>et al.</i> 2013). In Lyme Bay Reserve there is, arguably, more clearly defined work and task sharing through the working group, which should allow it to score more highly than average.</p>	
<p><b>Additional requirements/recommendation:</b> In practice, Memoranda of Agreement or Understanding between organisations are often in place, and there is good communication in Lyme Bay specifically through the Working Group. There is always room to improve communication.</p>	
<p>PI 3.1.3 Governance and Policy</p> <p><b>Long term objectives:</b> The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> At a national level, there are clear long term objectives for sustainable fisheries management under the Common Fisheries Policy, Marine Strategy Framework Directive; at a local level both IFCAs have similar objectives under the M&amp;CAA (Southall <i>et al.</i> 2013). The vision of the Working Group for the Lyme Bay Reserve also reflects these.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

PI 3.1.4 Governance and Policy <b>Incentives for sustainable fishing:</b> The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.	Likely scoring: Pass
<b>Why:</b> The Project Inshore assessment suggests that quota species where TAC is allocated have an inbuilt incentive (Southall <i>et al.</i> 2013). At a local level, the Code of Conduct constitutes a social incentive to increased sustainability.	
<b>Additional requirements/recommendation:</b> Incentives at a local and Lyme Bay level would be strengthened by additional permitting such as that proposed by Devon and Severn IFCA. Economic incentives from a strong brand could also strengthen buy-in.	

### Fishery-specific management system

PI 3.2.1 Fishery-specific management system <b>Fishery-specific objectives:</b> The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.	Likely scoring: Pass
<b>Why:</b> There is a fishery-specific EU multi-annual management plan for Western Channel sole, which meets the requirements for this PI (Southall <i>et al.</i> 2013).	
<b>Additional requirements/recommendation:</b> None.	
PI 3.2.2 Fishery-specific management system <b>Decision-making processes:</b> The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	Likely scoring: Pass
<b>Why:</b> There is a clear process by which decision making is based on ICES stock advice, with the multi-annual management plan setting out how this translates into TAC. EU long term management plans are deemed precautionary by ICES (Southall <i>et al.</i> 2013). Locally, IFCA's have a mandate to consult on management changes with all relevant stakeholders.	
<b>Additional requirements/recommendation:</b> Since fishery-specific decisions are taken at an EU level, the main local involvement is in gear management (particularly for bycatch and habitat effects); the Working Group is a means of facilitating such work.	
PI 3.2.3 Fishery-specific management system <b>Compliance and enforcement:</b> Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	Likely scoring: Pass
<b>Why:</b> There is a strong monitoring, control and surveillance (MCS) system in place, with MMO and the two local IFCA's being key organisations. The introduction of inshore VMS gold-plates the capacity to monitor compliance where appropriate.	

<b>Additional requirements/recommendation:</b> It will be important to ensure that the inshore VMS is properly integrated or joined up with existing MCS.	
PI 3.2.4 Fishery-specific management system <b>Research plan:</b> The fishery has a research plan that addresses the information needs of management	Likely scoring: Pass
<b>Why:</b> The multi-annual management plan is evidence of comprehensive research which is planned and delivered to support management needs (Southall <i>et al.</i> 2013).	
<b>Additional requirements/recommendation:</b> None for the sole fishery – although the effects of netting can be studied at a local level (see P2).	
PI 3.2.5 Fishery-specific management system <b>Monitoring and management performance evaluation:</b> There is a system for monitoring and evaluating the performance of the fishery specific management system against its objectives. There is effective and timely review of the fishery-specific management system	Likely scoring: Pass
<b>Why:</b> There is a high degree of monitoring and evaluation of performance of research, management and enforcement for this species.	
<b>Additional requirements/recommendation:</b> None for the sole fishery – although evaluation of management of netting can be studied at a local level, and essentially is underway through the IFCA byelaw reviews and as part of the process of examining fisheries through the efforts of the Lyme Bay Working Group.	

# Bass (*Dicentrarchus labrax*), Lining (trolling, handline etc.)

## Principle 1

### Outcome

<p>PI 1.1.1 <i>Outcome</i>  <b>Stock status:</b> The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>	<p>Likely scoring: Fail</p>
<p><b>Why:</b>                  ICES provide management for bass, although the fishery is data poor and stock status is uncertain. The Project Inshore assessment applied the Risk Based Framework in assessing stock status, and concluded that the Bass fishery posed a high risk to the species' productivity (Southall <i>et al.</i>, 2013). A recent ICES assessment suggested fishing mortality was increasing (likely to be above <math>F_{msy}</math>), and biomass decreasing. Although there were no recent recruitment estimates, up to 2009 the trend was for a decline (ICES, 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  Stock assessment of this species is hampered by inadequate information. Any data that can be collected at a local level would not likely be sufficient for assessment at a stock (regional) level.</p>	
<p>PI 1.1.2 <i>Outcome</i>  <b>Reference points:</b> Limit and target reference points are appropriate for the stock</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b>                  This is not a very helpful metric for this fishery, as no stock assessments are made. The score (80) is given automatically for this PI when the Risk Based Framework is used for 1.1.1 (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  There is not a clear action for the Working Group on this PI, given that stock management is undertaken by ICES.</p>	
<p>PI 1.1.3 <i>Outcome</i>  <b>Stock rebuilding:</b> Where stock is depleted, there is evidence of stock rebuilding within a specified timeframe</p>	<p>Likely scoring: Not assessed</p>
<p><b>Why:</b>                  As there is no stock assessment, this PI is not assessed as per the MSC Certification Requirements (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  The scope for stock rebuilding is at a regional level, so local action is not necessarily appropriate, although collaboration with national fishery managers may provide useful information which could inform understanding.</p>	

## Management

<p>PI 1.2.1 Management</p> <p><b>Harvest strategy:</b> There is a robust and precautionary harvest strategy in place</p>	Likely scoring: Pass with condition
<p><b>Why:</b></p> <p>There is a partial harvest strategy for which includes technical measures (including use of a MLS, (EC 850/98) at 36 cm length) and is likely to be sufficient to achieve sustainable management – however there is currently limited information of the sort necessary to understand if stocks are responding to management (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>At a local level, better understanding of the contribution of recreational fisheries to overall effort would be worthwhile.</p>	
<p>PI 1.2.2 Management</p> <p><b>Harvest control rules and tools:</b> There are well defined and effective harvest control rules in place</p>	Likely scoring: Fail
<p><b>Why:</b></p> <p>Harvest control rules are not comprehensive, and they are not linked to the stock status explicitly – i.e. exploitation rate is not necessarily reduced as the limit reference point is reached (Southall <i>et al.</i>, 2013). This is needed to meet the definition of “effective” under the MSC Criteria (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>There is not a clear action for the Working Group on this PI, given that stock management is undertaken by ICES; any local measures (such as controls – even voluntary – on recreational fisheries) can only be proven effective if there is a good understanding of the stock.</p>	
<p>PI 1.2.3 Management</p> <p><b>Information and monitoring:</b> Relevant information is collected to support the harvest strategy</p>	Likely scoring: Pass with condition
<p><b>Why:</b></p> <p>There is information available on commercial fishery removals (e.g. MMO landings, sales records) but poor understanding of stock structure, productivity and abundance. Recreational fishery removals may be significant, but are not currently quantified (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Lyme Bay data from the Fully Documented Fishery scheme could provide supporting information, and if data on recreational effort was collected the current uncertainty over the level of under-recording of total fishing mortality could be addressed. It might be worth taking advice on whether a local study might provide information useful in a wider context, in which case careful design of any information-gathering is advisable to make best use of the opportunity.</p>	
<p>PI 1.2.4 Management</p> <p><b>Assessment of stock status:</b> There is an adequate assessment of the stock status</p>	Likely scoring: Pass
<p><b>Why:</b></p> <p>There is no assessment of stock status – the pass here is automatic as per the MSC Certification Requirements (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>See previous.</p>	



## Principle 2

### Retained species

<p>PI 2.1.1 Retained Species  <b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Line fisheries (trolling, rod and line etc.) are highly selective; as such, they are not deemed to have a significant bycatch (retained or non-retained species) (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None, although any corroboration of this from the Fully Documented Fishery scheme would be useful.</p>	
<p>PI 2.1.2 Retained Species  <b>Management strategy:</b> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> With no main bycatch species, the fishery is not required to have a strategy in place for management (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.1.3 Retained Species  <b>Information/Monitoring:</b> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> With no main bycatch species, the fishery is not required to demonstrate this (MSC, 2013)</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

## Bycatch species

<p>PI 2.2.1 Bycatch Species  <b>Outcome status:</b> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Line fisheries (trolling, rod and line etc.) are highly selective; as such, they are not deemed to have a significant bycatch (retained or non-retained species) (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.2.2 Bycatch Species  <b>Management strategy:</b> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> With no main bycatch species, the fishery is not required to have a strategy in place for management (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.2.3 Bycatch Species  <b>Information/Monitoring:</b> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> With no main bycatch species, the fishery is not required to demonstrate this (MSC, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

## ETP species

<p>PI 2.3.1 ETP Species</p> <p><b>Outcome status:</b> The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The fishery is highly selective, and allows reasonable post capture survival for released species, although levels of interaction are probably low. Rod and line and trolling impacts are highly likely to be within requirements for ETP species (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Spatial data (from inshore VMS) is likely to provide better information to assess ETP interaction and confirm the level of risk the fishery presents.</p>	
<p>PI 2.3.2 ETP Species</p> <p><b>Management strategy:</b> The fishery has in place precautionary management strategies designed to: meet national and international requirements; ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; ensure the fishery does not hinder recovery of ETP species; and minimize mortality of ETP species.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b> There are some relevant management measures at a higher level regarding ETP species (through species and biodiversity action plans nationally, and as part of the SAC), but not a strategy that sees this directly implemented at a fishery level. However, the Risk Matrix starts to look at fishery level effects on ETP species and could form part of a management strategy.</p>	
<p><b>Additional requirements/recommendation:</b> A strategy could be embedded in the Code of Conduct, or another voluntary good practice scheme – on a practical level, this could be documented training on how to avoid ETP interactions and reporting of any encounters. Monitoring is technically needed (at least, to score higher at MSC assessment) to see whether the strategy is being implemented and succeeding.</p>	
<p>PI 2.3.3 ETP Species</p> <p><b>Information/Monitoring:</b> Relevant information is collected to support the management of fishery impacts on ETP species, including: information for the development of the management strategy; information to assess the effectiveness of the management strategy; and information to determine the outcome status of ETP species.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is some information on distribution of ETP species, and fisheries effort – but little linking the two (i.e. the frequency of interaction between lining fisheries and ETP species). The gears are low impact and have a limited footprint; current data is likely to be sufficient (Southall <i>et al.</i>, 2013).</p>	
<p><b>Additional requirements/recommendation:</b> Improvements in fisheries data – and particularly spatial information, via inshore VMS – can improve understanding or monitoring of interactions with ETP species, even in this low risk fishery.</p>	

## Habitats

<p>PI 2.4.1 <i>Habitats</i>  <b>Outcome status:</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  The level of interaction of line methods with the seabed is generally understood to be very low to nil, and MSC certified fisheries consistently score well over SG80 (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  None.</p>	
<p>PI 2.4.2 <i>Habitats</i>  <b>Management strategy:</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Where there is low interaction (as for line fisheries) between gear and habitats, limited management is needed and national measures are thought to be sufficient (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b>                  Feeding in information from spatial monitoring (VMS) to condition monitoring assessments within the Reserve (as will be required within the SAC) would help demonstrate the level of interaction, but is not necessary.</p>	
<p>PI 2.4.3 <i>Habitats</i>  <b>Information/Monitoring:</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.</p>	<p>Likely scoring:                  Pass</p>
<p><b>Why:</b>                  Good VMS data within the Lyme Bay Reserve should allow an unconditional pass, providing information on temporal and spatial interaction between fisheries and habitat.</p>	
<p><b>Additional requirements/recommendation:</b>                  None.</p>	

## Ecosystem

<p>PI 2.5.1 <i>Ecosystem</i></p> <p><b>Outcome status:</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> Lining has a low habitat impact and is highly selective, with limited bycatch (retained and non-retained). On an ecosystem level, the intensity of lining activity is considered minimal and there is little risk of damage to the wider ecosystem (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.5.2 <i>Ecosystem</i></p> <p><b>Management strategy:</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is management addressing ecosystem effects of fisheries on a national level, through MPA networks such as EMS and MCZ (Southall <i>et al.</i> 2013). Sensitive habitat interaction is low and spatial monitoring (inshore VMS) is or will soon be in place.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	
<p>PI 2.5.3 <i>Ecosystem</i></p> <p><b>Information/Monitoring:</b> There is adequate knowledge of the impacts of the fishery on the ecosystem</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> There is good information on ecosystem impacts of fisheries, with ongoing research programmes and monitoring at a national and international level (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

## Principle 3

### Governance and policy

<p>PI 3.1.1 Governance and Policy</p> <p><b>Legal and/or customary framework:</b> The management system exists within an appropriate and effective legal and/or customary framework which ensures it: is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and incorporates an appropriate dispute resolution framework</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> The framework of international (EU CFP), national and regional legislation and delivery bodies (Defra, MMO, IFCA) are thought to provide an appropriate and effective system of management (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b> In addition to this, local management through the Reserve Working Group and Code of Conduct strengthen the management framework for fisheries in Lyme Bay.</p>	
<p>PI 3.1.2 Governance and Policy</p> <p><b>Consultation, roles and responsibilities:</b> The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> While there is strong management at different levels, it is thought that there is room to more clearly define roles and responsibilities of different organisations where there is overlap (i.e. enforcement at the 6nm boundary between MMO/IFCA; between IFCA Districts, and in terms of scientific advice and research undertaken between Cefas/IFCA) (Southall <i>et al.</i> 2013). In Lyme Bay Reserve there is, arguably, more clearly defined work and task sharing through the working group, which should allow it to score more highly than average.</p>	
<p><b>Additional requirements/recommendation:</b> In practice, Memoranda of Agreement or Understanding between organisations are often in place, and there is good communication in Lyme Bay specifically through the Working Group. There is always room to improve communication.</p>	
<p>PI 3.1.3 Governance and Policy</p> <p><b>Long term objectives:</b> The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Likely scoring: Pass</p>
<p><b>Why:</b> At a national level, there are clear long term objectives for sustainable fisheries management under the Common Fisheries Policy, Marine Strategy Framework Directive; at a local level both IFCA have similar objectives under the M&amp;CAA (Southall <i>et al.</i> 2013). The vision of the Working Group for the Lyme Bay Reserve also reflects these.</p>	
<p><b>Additional requirements/recommendation:</b> None.</p>	

<p>PI 3.1.4 Governance and Policy</p> <p><b>Incentives for sustainable fishing:</b> The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>The Project Inshore assessment suggests that nationally, non-quota species not governed under Regulating Orders lack some of the incentives that “ownership” such as this provides (Southall <i>et al.</i> 2013). At a local level, the Code of Conduct constitutes a social incentive to increased sustainability, but for commercial bass fisheries, the non-regulated recreational sector, which can contribute to total fishing effort, can act as a disincentive.</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Incentives at a local and Lyme Bay level would be strengthened by understanding the contribution of the recreational sector to bass fishing effort, with a Code of Conduct or some form of restriction (for example, a bag limit) an option to consider, to foster goodwill and a sense of stewardship. There is also scope to brand line caught bass, with economic incentives to comply to a Code of Conduct in order to benefit from branding opportunities</p>	

### Fishery-specific management system

<p>PI 3.2.1 Fishery-specific management system</p> <p><b>Fishery-specific objectives:</b> The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>There are some fishery specific objectives, although they are not yet fully developed or implemented within a management system likely to achieve the outcomes in P1 and 2 (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>None, realistically, as the objectives and management (at EU) are outside the purview of the Working Group.</p>	
<p>PI 3.2.2 Fishery-specific management system</p> <p><b>Decision-making processes:</b> The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives</p>	<p>Likely scoring: Pass with condition</p>
<p><b>Why:</b></p> <p>Bass is now under management at ICES, although relatively recently and the process by which decision making happens is not yet clear (although likely to be made at EU level) (Southall <i>et al.</i> 2013).</p>	
<p><b>Additional requirements/recommendation:</b></p> <p>Since fishery-specific decisions are taken at an EU level, local involvement is limited.</p>	
<p>PI 3.2.3 Fishery-specific management system</p> <p><b>Compliance and enforcement:</b> Monitoring, control and surveillance mechanisms ensure the fishery’s management measures are enforced and complied with</p>	<p>Likely scoring: Pass with condition</p>

**Why:**

There is a strong monitoring, control and surveillance (MCS) system in place, with MMO and the two local IFCA's being key organisations. The introduction of inshore VMS gold-plates the capacity to monitor compliance where appropriate. However, the recreational sea bass fisheries are significant enough that they could be considered a gap in enforcement (Southall *et al.* 2013).

**Additional requirements/recommendation:**

It will be important to ensure that the inshore VMS is properly integrated or joined up with existing MCS; equally, a risk assessment with the respect to recreational fisheries would help improve understanding of any compliance gaps.

PI 3.2.4 Fishery-specific management system

**Research plan:** The fishery has a research plan that addresses the information needs of management

Likely scoring:  
Pass with  
condition

**Why:**

There is evidence of fishery-specific research underway, with bass now part of ICES WGNEW – this is starting to address some of the information gaps (such as defining stock units) but is not yet at a level where there is a strategic research plan up and running (Southall *et al.* 2013). Arguably, the recreational sector has not yet been characterised, although there was a recent Cefas project which aimed to assess RSA activity.

**Additional requirements/recommendation:**

At a Lyme Bay level, effort could most usefully be directed at understanding the impact of the recreational sector, although it would be worth checking on the status of the Cefas survey (which was to have taken place in 2013).

PI 3.2.5 Fishery-specific management system

**Monitoring and management performance evaluation:** There is a system for monitoring and evaluating the performance of the fishery specific management system against its objectives. There is effective and timely review of the fishery-specific management system

Likely scoring:  
Pass with  
condition

**Why:**

There is some general monitoring of the effectiveness of fishery management (which bass management falls under), although the fishery-specific management framework for this species is still underdeveloped, and so is performance evaluation (Southall *et al.*, 2013).

**Additional requirements/recommendation:**

None at a local level.



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