MARINA PROJECTS

STUDLAND BAY SEAGRASS PROJECT

The Crown Estate

VISITOR MOORING VIABILITY APPRAISAL

April 2011

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STUDLAND BAY SEAGRASS PROJECT

VISITOR MOORING VIABILITY APPRAISAL

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CONTENTS

Page

1. INTRODUCTION

1.1 BACKGROUND

The seabed in Studland Bay is owned by The Crown Estate and the foreshore is owned by the National Trust. The location has long been an iconic visitor destination on the South Coast for boaters and non-boaters seeking the shelter and enjoyment of this natural sandy bay. Studland Bay is extensively covered by seagrass meadows. The Seagrass requires shelter and relatively shallow water in which to thrive; similar attributes that play a part in attracting recreational boaters to use Studland Bay as an anchorage.

The Studland Bay seagrass meadows support a colony of spiny and short snouted seahorses, both of which in 2008 were added to the list of protected species under the Wildlife and Countryside Act[1]. The legislation provides that Spiny and short snouted seahorses are protected against killing, injuring or taking and also make it an offence to cause damage or destruction to its places of shelter, or disturbance while such animals are occupying places of shelter. Accordingly the seagrass meadows in Studland Bay are effectively afforded protection under the 1981 Act. The existence of this protecting legislation has led to concerns that their habitat may be detrimentally affected by recreational boating. Of particular concern is the potential disturbance to seagrass when anchors are deployed and retrieved from the seabed leaving the plant unable to regenerate as a result.

It is important to note that this is one view, an opposing view is that the mooring activity has in part enhanced the habitat which some report as being more extensive over the last 20-30 years.

Although The Crown Estate own the seabed it is subject to a public right of navigation, which includes the right to anchor. Due to the environmental concerns relating to the protection of the natural habitat, there has been a great deal of debate as to how to establish the impacts of anchoring activity and how best to balance the concerns with the desire to maintain recreational use of the area.

A two year research project managed by The Crown Estate and Natural England has seen the introduction of a modest but dedicated voluntary no anchor zone

[1] The Wildlife & Countryside Act (1981)

(VNAZ), in order that an assessment of the impacts of anchoring might be made over this period. Figure 1.1 below depicts Studland Bay and the location of the VNAZ.

The study work which is the subject of this report aims to look at the viability of introducing suitable mooring facilities to Studland Bay in response to calls to regulate this activity. Importantly the study does not express a view on whether the anchoring activity is detrimental, beneficial or neutral to the health of the seagrass habitat.

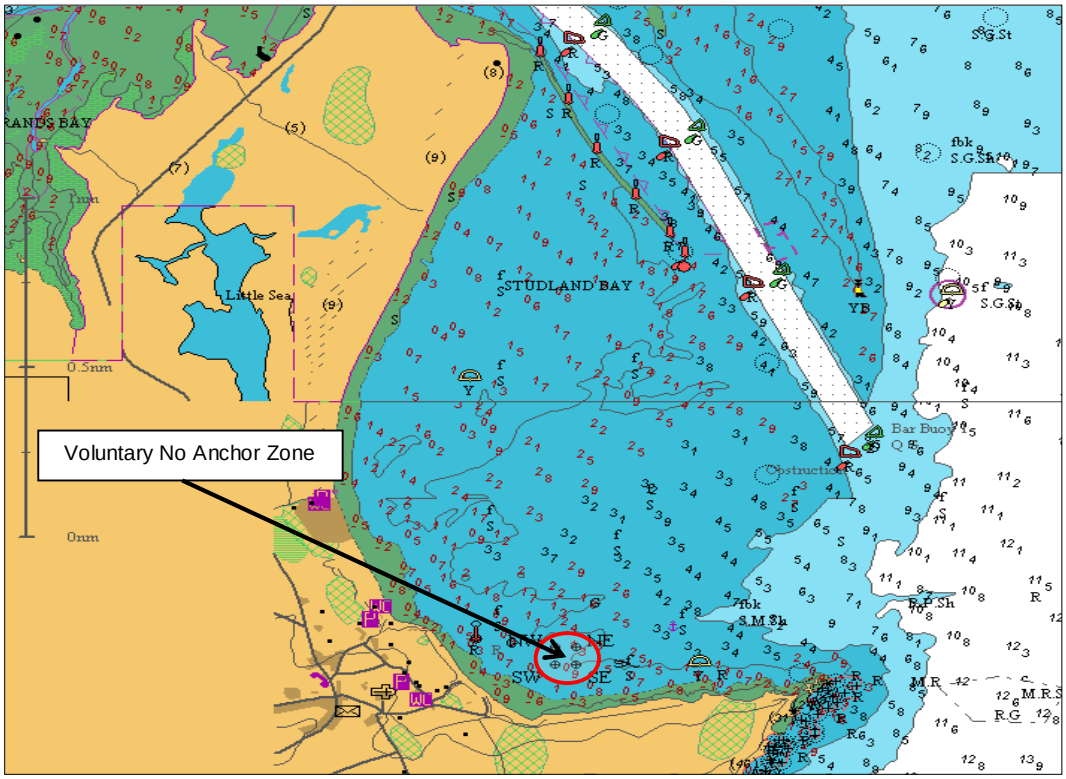

Figure 1.1 – Studland Bay

1.2 THE CROWN ESTATE

The Crown Estate is a body established by the Crown Estate Act 1961 and is charged by Parliament with responsibility for managing property interests belonging to the Sovereign as part of the hereditary possessions of the Crown. The Marine Estate is one of four constituent estates which make up the property interests managed by The Crown Estate.

The Marine Estate includes virtually the entire seabed of the UK out to the 12 nautical mile territorial limit. The statutory duty of the Crown Estate is to maintain

and enhance the land and property rights under its management having regard to the requirements of good management.

1.3 MARINA PROJECTS LTD

Marina Projects Limited is a specialist international consultancy practice providing a range of services to the marina and property industries covering all aspects of marina and waterfront development. From feasibility studies through to master planning and operational management, the Company has the knowledge and resources to meet a Client's most demanding requirements.

Marina Projects has in-depth experience of working with a wide variety of Clients, including private developers, investment groups, commercial organisations and public bodies including Development Agencies and Local Authorities. Services include:

- Feasibility Studies and Market Research
- Masterplanning
- Business Planning
- Marina Design
- Marina Management
- Project Management
- Environmental and Legislative Advice
- Specialist Advice

The principals of Marina Projects Ltd have extensive experience in marina and waterfront development and management ranging from stand alone marina schemes and boatyards to comprehensive mixed use residential and commercial projects.

The combined team has well over 100 years experience working in the UK marine industry and has strong links within the UK marina industry and worldwide industry Associations. Furthermore they represent an effective team covering all disciplines from market review, business case analysis, feasibility studies, concept development, master planning, detailed design, environmental assessment and project management through to marina operational management.

The Marina Projects team has developed a depth of knowledge and expertise in the design, development and operation of successful marina and waterfront

businesses that create value for Clients and other stakeholders. Over an extended period that expertise has been applied to a wide range of projects both in the UK and overseas and since the formation of Marina Projects the value and strength of the team has become even more apparent and has been applied to good effect on a number of significant projects worldwide.

1.4 STUDY BRIEF

Marina Projects Ltd has been appointed by The Crown Estate in connection with the preparation of a high-level viability appraisal of the potential to introduce dedicated visitor moorings in Studland Bay.

It is intended that the viability assessment will culminate in the presentation of a report that provides a robust, independent but (at this stage) necessarily preliminary appraisal of the project viability. In order to undertake such an appraisal the key components of this report are noted below:

- Market & User Groups
- Design/capital costs
- Charging arrangements and income generating potential
- Operational considerations /management costs
- Viability appraisal

The following sections of this report follow the above headings bringing together appropriate information to inform the viability appraisal which is presented at Section 6.

The study is not intended to be a detailed feasibility of a proposal to install eco-friendly moorings in Studland Bay and it should not be read as such. In order to complete such a piece of work further and more detailed analysis will be required, e.g. of the specific ground conditions and engineering design of the moorings.

2. OVERVIEW OF STUDY SITE

Studland Bay is located to the south of Poole Harbour entrance. The location offers excellent shelter from the South, South West and North West, however the location is exposed from both the North and East.

With only a modest tidal range (1.6m during Spring tides and 0.5m during the Neap tidal cycle) the location also offers good levels of access, ground conditions and water depth for a range of vessel types. Typically there is between 2.5m and 3m of water above Chart Datum to the south of the Bay, reducing to 1m to the North, both zones drying to the west with the formation of the beach.

In summary the following factors make for an ideal anchorage for leisure boaters:

- shelter from the prevailing weather conditions
- limited tidal range
- soft/good ground conditions
- attractive beach and natural setting

Accordingly the process of anchoring and anchor setting is relatively straight forward and to that end both novice and experienced boaters have utilised the area for many decades.

Poole Harbour entrance during the peak season becomes a vibrant and busy channel mixing both commercial and leisure vessels within a limited water area, this is a further factor influencing the desire for boaters outside of Poole Harbour to anchor in Studland Bay without the need to negotiate the busy entrance channel.

Facilities are limited, to an onshore café, fresh water tap and refuse store; there is also a nearby public house. This relative shortfall in facilities in many ways enhances the natural setting and appears to have no bearing on the continued desire for boaters to utilise this historic sheltered mooring location.

3. MARKET OVERVIEW

Studland Bay to the West of the Solent is the only sheltered anchorage from the prevailing South Westerly winds between Weymouth and the Needles. With the greatest density of leisure boat activity within the UK, the Central South Coast region, extending from Weymouth and Portland to the West and Chichester Harbour to the East offers over twenty seven thousand berths and moorings for leisure vessels. This zone can be considered to represent the wider market area for the purposes of this study

As a visitor destination in its own right Studland Bay serves as a destination stop over for vessels berthed in locations noted in Figure 3.1 below. A summary of the berth numbers, ratio of motor to sail and vessel sizes is noted in the following section.

Figure 3.1 below identifies Studland Bay and the main resident berthing locations from within the central south coast region.

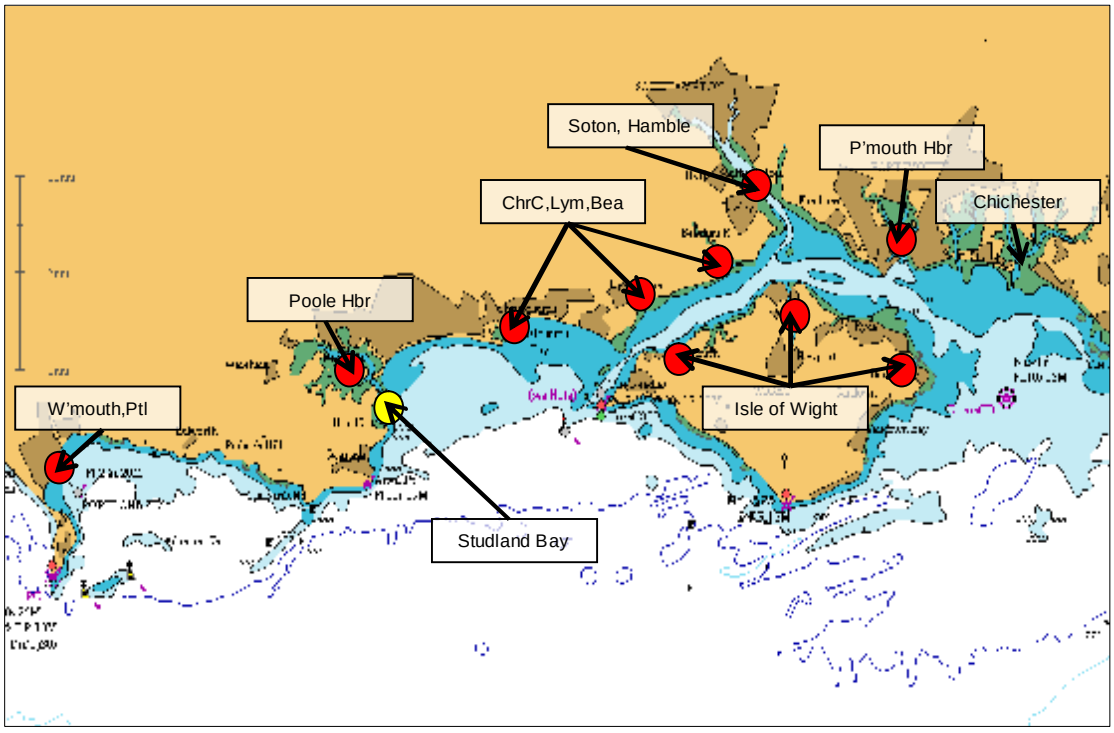

Figure 3.1 Studland Bay and Central South Coast Berthing Locations
Source Admiralty Chart Copyright UKHO licence No.11208

3.1 STUDLAND BAY USER GROUPS

As noted previously, Studland Bay offers a safe anchorage for a multitude of vessel types. In addition to providing a refuge anchorage for passing vessels in poor weather conditions the following key user groups currently utilise the facility and reference to both the type of user as well as the type of vessel is required to inform the provision of any proposed mooring system.

Existing users of the area include the following main groups:

- Day boats/sports boats seeking short stay stop-over
- Cruising vessels (motor/sail) seeking a short stay stop-over
- Cruising vessels (motor/sail) seeking an overnight anchorage
- Commercial vessels (fishing vessels, training vessels) seeking shelter
- Various vessels seeking shelter from the channel and/or awaiting an entrance window.

Whilst the study site is best known as a day anchorage, the shelter provided and lack of a local alternative does result in a level of overnight anchoring activity. Whilst the extent of this activity is unknown it is likely to be the case that the added security of a dedicated and managed mooring system, alongside the natural advantage of the location would encourage a greater degree of overnight usage.

3.2 MARKET DEFINITION

For the purposes of this study it is necessary to consider the types of vessel and user groups likely to moor in Studland Bay. The majority of the short stay activity, because it is linked to “day boat” use is likely to come from the local market area with cruising and overnight activity coming from both the local and wider market. By looking at the nature of vessels and activity in these areas we can determine the nature of vessels and scale of demand that might exist for recreational moorings.

3.2.1 Local Market

For the purposes of this study the local market is defined as extending in a 30 mile radius from the study site. This would extend to Portland in the

West to the Beaulieu River in the east and include the western end of the Isle of Wight. A motor boat travelling at 15 knots (over the ground) could reach Studland Bay in 2 hours making it a viable day visitor location.

That is not to say that vessels from outside of this area could not or would not use Studland Bay as a short stay destination but rather that the vast majority of vessels anchoring for the short term would come from within this area.

3.2.2 Wider Market

The Wider Market extends across the rest of the central south coast region extending out to Chichester Harbour in the East. This central south coast is a long established and ever increasing marine leisure berthing destination that is considered to be the primary focus of the UK leisure boating industry. Extensive mooring facilities are provided across this sector of the south coast market area, offering berthing provisions for a range of boat and customer types. Furthermore, every aspect of the leisure marine market is accommodated across the area, from dingy sailing; day boating; visitor/cruising; yacht racing and pleasure sailing.

As noted the majority of any overnight mooring activity would arise from this area and whilst this data set does not link boat numbers to activity in Studland Bay, it serves to confirm the volume of users and their respective home ports, types of activity, and the mix of vessel sizes likely to utilise a visitor mooring (anchor or otherwise) within the study site.

It is an important characteristic of the region that the vast majority of marinas specifically provide full tidal access with limited restrictions e.g. locks & bridges. Furthermore the tidal conditions across the Solent are ‘not too challenging’ for leisure boaters, creating consistent levels of activity where more challenging conditions inhibit less experienced boaters.

These two factors will to some extent influence the levels of activity at Studland Bay in so much as there are no ‘peaks and troughs’ in visitor activity linked to tidal conditions. Therefore the peak season will see the anchorage zone being utilised throughout the daylight hours. With a wealth

of fully serviced marina berths within the area, it is the aspiration of some boaters to seek a more isolated, 'back to basics' mooring provision for the day/night.

3.3 AREAS OF ACTIVITY

Working across the market areas from west to east the principle areas of leisure boat berthing and associated activity are scheduled below with the approximate minimum cruising distance to Studland Bay, in nautical miles identified. The assessment is noted as a minimum as it takes the distance from the study site to the entrance to the identified river or harbour area:

Location (West to East)	Min. Cruising Distance to Study Site (Nm)	Local or Wider Market
Weymouth and Portland	27Nm	Local
Poole Harbour	3Nm	Local
Christchurch	10Nm	Local
Keyhaven	18Nm	Local
Isle of Wight (west)	18Nm	Local
Lymington River	21Nm	Local
Beaulieu River	28Nm	Wider
Soton Water and Hamble	32Nm	Wider
Isle of Wight (east)	40Nm	Wider
Portsmouth Harbour	38Nm	Wider
Chichester Harbour	41Nm	Wider

Table 3.3 – Local & Wider Market locations – distance to study site

The following section provides a high level review of the main areas of boating activity noted above, the extent and type of mooring activity and provides an indication of the typical vessel mix.

3.3.1 Weymouth & Portland (Local Market)

Mooring Type and Numbers

Located some 27 Nautical miles form Studland Bay, Weymouth and Portland together provide over 1,100 leisure berths. The motor boats berthed within this area are likely short stay visitors to the destination in pat

due to the absence of sheltered anchorages in between. All non-day boat vessels are likely to view Studland as a potential overnight destination.

The total number of moorings within Weymouth and Portland is divided by the berthing types noted in table 3.3.1.

Mooring Type	Mooring number
Drying/Swinging Quay wall moorings	100
Pontoon Berths	1000
Total provision	**1,100**

Table 3.3.1 total berthing provision

Average Boat Size & Ratio of Motor to Sail

A high level overview of existing vessels within the berthing locations noted concludes that the average vessel size within Weymouth and Portland is 9.6m (although it is understood that with the eventual future expansion of the new Portland facility from 300 to 600 berths, there is the provision for larger vessels). The ratio of motor to sail boats (influencing primarily the depth of water required to operate the craft) is 70/30 in favour of sailing vessels.

This would suggest that around 30% of the total i.e. all motor boats would be potential day visitors to Studland Bay with in excess of 50% being potential cruising vessels that might be prepared to moor overnight in the location during peak season.

Overview

Weymouth and Portland have contrasting vessel types due to the nature and age of the facilities. Weymouth being a historic fishing port that is evolving into a marine leisure facility and Portland being a new flagship fully serviced marina facility for the future. The majority of moorings are now fully serviced walk ashore pontoons with less than 10% being provided by quay wall and drying berths.

3.3.2 Poole Harbour (Local Market)

Mooring Type and Numbers

In total there are some 5,300 leisure moorings in Poole Harbour. The total number of berths is provided in three distinctive mooring categories as noted in table 3.3.2 below. The majority of these vessels are berthed within 5 nautical miles from the study site. Accordingly the vast majority of these vessels could be considered potential visitors to Studland Bay.

The total number of moorings has slightly reduced over recent times with the closure of Poole Boat Park due to the construction of the second road bridge. However, plans to increase the pontoon mooring provision by Poole Harbour Commissioners may see an additional 80 moorings in the short term with an aspiration to create a further 950 berth marina over the next 5 years as part of a Poole Harbour Masterplan.

Poole Harbour is perhaps the most significant market area, due to its immediate proximity to the study site. A great number of vessels utilising the facility have permanent moorings within Poole Harbour and view Studland Bay as a primary visitor destination.

Mooring Type	Mooring number
Drying/Swinging moorings	2,427
Pontoon Berths	2,257
Dry Stack facility	240
River Frome Pontoon/swing	370
Total provision	**5,294**

Table 3.3.2 Poole Harbour Berthing Provision

An analysis of the 'typical' berth mix within Poole Harbour is noted below indicating the number and size of vessels utilising the Harbour and likely to utilise the anchorage in Studland Bay.

Average Boat Size & Ratio of Motor to Sail

A survey was conducted in 2007 of the marinas both by visiting the sites and review of detailed aerial photography to establish the ratio of sail to

motor vessels. It was concluded that the overall split in all marinas was 71% motor and 29% sail. This analysis ignores the vessels berthed in dry stack facilities and the Sunseeker Wharf facility as these would skew the ratio further in favour of motor vessels. The Poole Harbour ratio of motor to sail is in stark contrast to the Central Solent where the split is nearer 50/50.

Overview

The Poole Harbour market has a number of distinct features and factors which influence the nature of marine leisure use of the Harbour. These are summarised below:

- The natural shelter makes the Harbour suitable for water sports and particularly attractive as a day boating destination.
- There are many tidally restricted and shallow areas of the Harbour.
- Notwithstanding the modest tidal range, there are some notable tidal flows at the Harbour entrance due to the sheer volume of water entering and egressing the Harbour particularly during Spring tides.

All of the above factors contribute to making the Harbour more attractive to motor boats and in particular smaller day boats and this has resulted in a higher proportion of motor vessels being berthed within in the Harbour. Furthermore the natural shelter provided by the Harbour, the attractive natural setting and the extensive boating opportunities that are available serve to provide a longer season and more attractive location, particularly when compared to locations to the West of Poole, e.g. Weymouth & Portland.

3.3.3 Christchurch, Keyhaven, Lymington & Beaulieu (Local Market)

Mooring Type and Numbers

These locations are between 10 and 28 nautical miles from Studland Bay and they provide a total of over 2,300 leisure moorings. This total is made up of the berth types noted in table 3.3.3.

The majority of vessels are berthed within the local market zone however the distance and time taken to transit down the Beaulieu River puts these

berths on the very edge of a viable day visit to the study site, therefore these berths are excluded from the local market assessment.

Mooring Type	Mooring number
Drying/Swinging moorings	944
Pontoon Berths	1,330
Dry Stack facility	80
Total provision	**2,354**

Table 3.3.3 Christchurch to Beaulieu Berthing Provision

Average Boat Size & Ratio of Motor to Sail

A high level review of vessels on berths within the facilities noted above confirms that the average vessel size within Christchurch and Keyhaven is 7.1m where as the averages for Lymington and Beaulieu combined is 9.9m. This contrast is primarily a function of the water access and berthing facilities offered. Motor to sail ratios are however comparable, with a ratio of 75-25 in favour of sailing vessels.

Overview

The main attributes of the areas noted are:

- Christchurch and Keyhaven are historic berthing facilities with predominantly small day boat activities and given the proximity the majority would be potential day visitors to Studland Bay.
- The greater distance from Studland Bay to the Lymington River suggests that only motor boats from this location would be potential day-visitors to Studland Bay. Larger vessels of either motor or sail form these locations would consider taking an overnight mooring if cruising in the area during appropriate weather conditions, this would account for in the order of 60% of the total vessels in these areas.

3.3.4 ISLE OF WIGHT (limited local market & Wider Market)

Mooring Type and Numbers

There are a total of over 3,600 leisure moorings on the Isle of Wight although a reasonable proportion of these are dedicated to visitor berths

and therefore do not result in providing an equivalent number of vessels into the local market.

The western most berthing location on the Island is Yarmouth which is located just 20 nautical miles from Studland Bay. Some 300 moorings are provided in total of which around 50% are available for resident vessels. The motor boat element would certainly view Studland as a viable day boating destination.

Cowes sits at the mouth of the Medina Estuary and from the entrance is a minimum transit of 29 Nautical miles to the site. The extent of the visitor facilities en-route suggest few vessels berthed in and around Cowes would visit for the day and it is therefore considered to sit within the wider market as are the other locations further east. The Island is home to a sizable market that is within an easy day sail from the study site. Table 3.3.4 below illustrates the mix of mooring types on the Island.

Mooring Type	Mooring number
Drying/Swinging moorings	2,261
Pontoon Berths	1,172
Dry Stack/Dry Sail facility	200
Total provision	**3,633**

Table 3.3.4 Isle of Wight Berthing Provision

In addition to the fixed moorings identified in the figures above, there are numerous anchorages throughout the Island, which are, without exception, over subscribed during the high season. In some instances, anecdotal reports of vessels rafted two and three abreast is not uncommon during regattas and event days. Whilst this primarily demonstrates the level of seasonal demand for berthing within the local market and the shortfall in berthing provisions during peak times, it also serves to demonstrate that berthing type becomes a secondary consideration over location during peak high season.

Average Boat Size & Ratio of Motor to Sail

Berth sizes within the area are primarily a function of the access that the specific location provides. Larger vessels require a proportionately greater

depth of water to stay afloat and as such the deep water moorings identified offer the largest of the berths within the area. By contrast drying harbours such as Ryde and to a lesser extend Bembridge offer a limited berthing facility in terms of access and this influences the length of vessel that the facility attracts. A cross section of vessels identified in these locations suggests an average length of 8.6 metres.

3.3.5 Southampton Water & River Hamble (Wider Market)

Mooring Type and Numbers

Southampton Water, including the River Itchen and Hamble River is home to over 4,700 leisure vessels. With the entrance to Southampton Water located 32 nautical miles from Studland Bay the additional transit distance to the moorings puts them all beyond a reasonable day transit and firmly on the wider market category. The total berthing provision is made up of the berth types noted in table 3.3.5 below:

Mooring Type	Mooring number
Drying/Swinging moorings	920
Pontoon Berths	3,065
Dry Stack/Dry Sail facility	720
Total provision	**4,705**

Table 3.3.5 Southampton Water & Hamble Berthing Provision

Whilst this level of boating activity does provide a market that feeds activity into the facility at Studland Bay, it is somewhat restricted to vessels that can accommodate an overnight stay, very generally speaking vessels over 9m in length.

Average Boat Size & Ratio of Motor to Sail

The average boat size for the Southampton and Hamble location is 11m with an almost equal split between motor and sail. The number of vessels which are over the 9m threshold noted above accounts for around 70% of the total vessels.

3.3.6 Portsmouth Harbour (Wider Market)

Mooring Type and Numbers

At approximately 38 Nautical miles from Studland Bay, Portsmouth Harbour is home to over 5,000 leisure vessels and firmly in the wider market area. Table 3.3.6. illustrates the ratio of berths by type.

Mooring Type	Mooring number
Drying/Swinging moorings	2,540
Pontoon Berths	2,280
Dry Stack/Dry Sail facility	180
Total provision	**5,000**

Table 3.3.6 Portsmouth Harbour Berthing Provision

Average Boat Size & Ratio of Motor to Sail

A review of the average boat size within the Harbour suggests an average vessel size of around 9m for all vessels currently residing in the harbour. The ratio of motor boats and sailing boats is similar to that of Southampton Water and River Hamble with a ratio of roughly 50/50. Some 65% of vessels however are greater than 9m in length and could be classed as cruising vessels that might use Studland Bay as an overnight mooring destination.

3.3.7 CHICHESTER HARBOUR

Mooring Type and Numbers

Located 41 Nautical miles from Studland Bay and the most easterly of the market locations, Chichester Harbour is home to over 11,000 leisure vessels (including dinghies and tenders). There are 5,200 resident moorings both swinging and drying berths, as well as fully serviced walk ashore marina berths. The split between mooring types is noted in Table 3.3.7 below.

Mooring Type	Mooring number
Drying/Swinging moorings	3,400
Pontoon Berths	1,800
Total provision	**5,200**

Table 3.3.7 Chichester Harbour Berthing Provision

Average Boat Size & Ratio of Motor to Sail

A survey was conducted in 2010 which concluded that the vessels residing and utilising Chichester Harbour are of an average size of a little under 9m. This is a reflection of the extensive dingy and day sailing activity that occurs in the protected waters of the harbour. The nature and extent of this activity is influenced by the harbours physical characteristics.

Overview

Clearly its remoteness from Studland Bay confirms that vessels berthed in Chichester Harbour are unlikely to use the anchorage for short term daily berthing. As there are limited boating opportunities within the harbour for deeper drafted vessels it is clear that the majority of vessels berthed in marinas in Chichester Harbour Marinas tend to use Chichester Harbour as a base from which to cruise, with Solent being the main destination. This would suggest a maximum of around 1,800 vessels that could cruise in the area for an overnight berth.

3.4 CENTRAL SOUTH COAST SUMMARY

In order to establish the approximate extent of usage from the local market of short stay mooring take-up by day boats and the proportion of cruising vessels in the wider market, that might take up overnight moorings we have reviewed typical vessel mix data from our database. Figure 3.1 below provides the approximate spread of vessel size across various market areas.

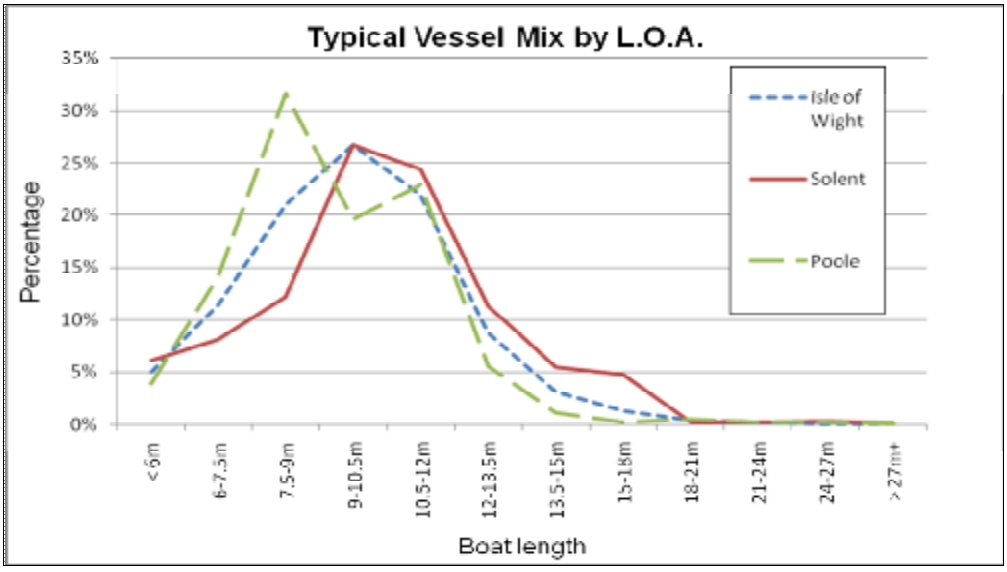

Figure 3.4 – Typical Vessel Mix

Table 3.4.1 below summarises the berth provision by the main areas of activity noted in section 3.3 above and using the vessel mix data and general details of the areas of activity estimates the split between the day boat usage (i.e. under 9m length) and the cruising activity that might represent the market for overnight anchoring.

Location	Approx. Total Leisure Vessels	Market Area	Potential Day Visitors	Potential O/night visitors
Weymouth & Portland	1,100	Local	330	650
Poole Harbour	5,300		5,300	2,650
Christchurch & Keyhaven	480		350	250
Isle of Wight (west)	450		225	250
Lymington	1550		400	950
Beaulieu	270	Wider	Nil	150
Southampton Water & River Hamble	4,700		Nil	3,000
Isle of Wight (east)	3,150		Nil	1,900
Portsmouth Harbour	5,000		Nil	3,500
Chichester Harbour	5,200		Nil	1,800
Totals	**27,200**		**6,700**	**15,100**

Table 3.4.1 – Summary of Local and Wider Market

The analysis from the market overview confirms that there are in excess of 27,000 leisure moorings across the central South Coast region.

The bulk of the market for day visitors to Studland Bay not surprisingly comes from the moorings in Poole Harbour due to their immediate proximity. It is worth noting that the broad assessment of the day visitor market makes no allowance for vessels launched from slipways within the local market area, suggesting the potential market is actually very much bigger.

The extensive leisure boating activity within the Central South Coast is a clear indicator that there will be continued demand for leisure boating destinations within these popular coastal waters that extend out to the study site. Historically Studland

Bay has served as both a 'bolt-hole' and leisure destination for a wide and varied range of recreational and commercial boaters. The extent of the potential market; the strength of the location; the fact that it is the only viable sheltered anchorage in the immediate area; all confirm that this demand will exist well into the future and there is no reason to suggest that it will diminish.

3.5 VISITOR ACTIVITY/TRENDS

The central south coast boasts the highest levels of recreational visitor boat activity in the UK; there is a constant migration of vessels between the numerous marinas, anchorages, harbours and visitor facilities. There is however a distinct trend in the seasonality of the activity with the bulk of the activity occurring in the summer months of June-September.

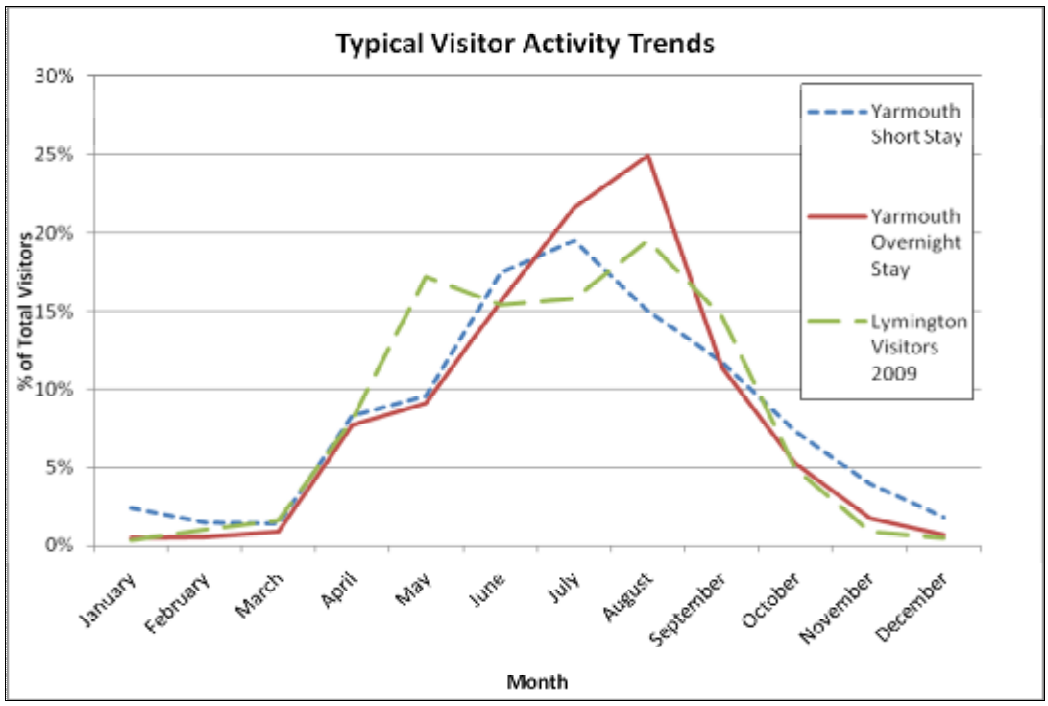

Figure 3.5 – Typical Visitor Activity Trends

Figure 3.5 identifies the typical spread of visitor activity over a 12 month period in Yarmouth Harbour, one of the prime Solent visitor destinations and from the dedicated visitor moorings operated by Lymington Harbour Commissioners. The source data comes from annual reports and from information presented to local stakeholder meetings. The data for Yarmouth identifies both short stay and overnight activity. This graph demonstrates clearly the seasonality issue with the months of peak activity when visitor moorings are at or near capacity during

summer weekends, along with the general trend lines for the increase and decrease of activity during the “shoulder” months.

The trends in activity derived from the above analysis will provide a good indicator and benchmark for the likely levels of mooring activity and therefore the associated income generation. Further considerations will be the tariff structure, potential new markets utilising the dedicated anchorage as well as the loss of historic user groups, who may not wish to pay for a mooring.

4. SITE CONSTRAINTS

4.1 WATER AREA

The useable water area within Studland bay taking account of the following key factors is outlined in figure 4.1:

- Natural Shelter afforded by the bay
- Useable water depths (excluding a number of isolated obstructions)
- Proximity to Poole Harbour entrance channel
- Distance from the shore (mechanically propelled craft)

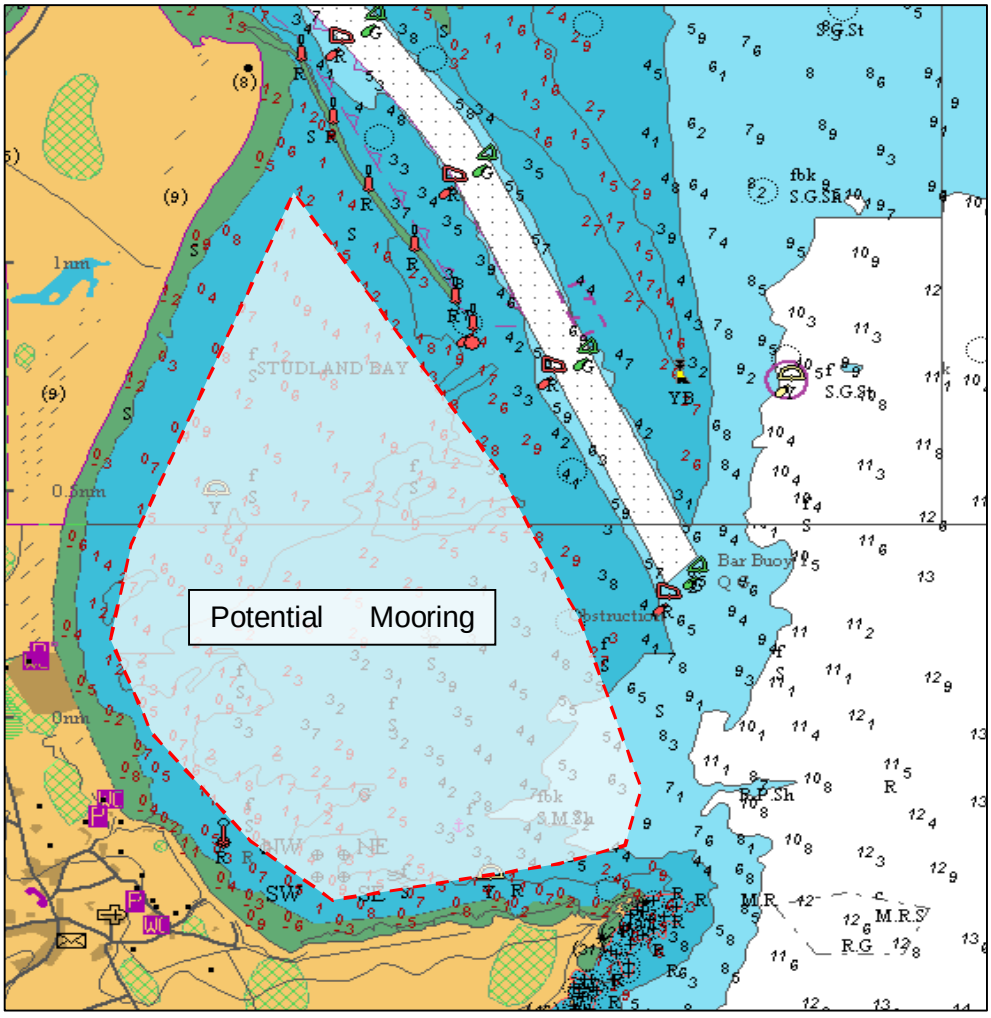

Figure 4.1 Indicative Potential Berthing Area
Source Admiralty Chart Copyright UKHO licence No.11208

This high level analysis of the water area has identified a useable mooring zone of some 850 acres, or 344 hectares. During a site visit some 30 mooring buoys were observed within the middle beach sector and it is assumed that these moorings are of traditional form i.e. anchor block and mooring chain. Furthermore it is

understood that the Marine Management Organisation has details of a total of 51 moorings that have been present in the bay for some years. Proposals for a dedicated anchorage might consider if and how to incorporate the existing mooring provision with an overall scheme to better improve the management of moorings.

It is clear that the available water area far outweighs the seasonal berthing demands identified previously and this indicates that it is probably the case that it is the desirability and protection of a particular zone and level of activity on a given day that dictates current mooring patterns. This might suggest that there is the potential to establish dedicated mooring areas with eco-moorings/buoys in addition to over-spill areas which could be provided in the slightly less desirable and less dense areas of seagrass habitat.

4.2 SITE CONDITIONS

Studland Bay has the following tidal conditions:

Tide Condition	Level Above Chart Datum
Highest Astronomical Tide	+2.6m
Mean High water Springs	+2.2m
Mean High water Neaps	+1.7m
Mean Low water Neaps	+1.2m
Mean Low Water Springs	+0.6m
Lowest Astronomical Tide	+0.0m

Table 4.2 – Tide Conditions

The tidal range at Studland Bay is 1.6m during Spring tides reducing to 0.5m at Neap tides. Whilst the tidal range is modest, the tidal flows to the north of Studland Bay at the entrance to Poole Harbour are more notable and most significant during the Spring tidal cycle during the Ebb.

4.3 GROUND CONDITIONS

BGS data provided by the Crown Estate identifies the general conditions of the seabed within the mooring zone noted in section 3.1. This suggests that the

conditions should be suitable for a form of anchor device to secure a vessel mooring. The data does not constitute a detailed ground investigation report. The BGS data identifies that the ground conditions on this area of the seabed are made up of the following properties:

- Gravelly sand
- Gravelly mud
- Sandy gravel
- Slightly gravelly sand
- Bedrock

The bedrock geology is constructed of:

- Chalks
- London clay
- Reading formation and London clay formation

Additional site specific and location specific core samples will be required to ascertain the density of the seabed and the associated holding properties to inform the detailed design of a mooring system.

5. MOORING DESIGN AND CAPITAL COSTS

5.1 CAPACITY/LOADING

Utilising the market analysis from Section 3.1 we are able to identify a number of distinctive market sectors that utilise the moorings and in turn different vessel types, namely:

- ‘Sports boats’ – motor - typically no larger than 8m with a draft of <1.2m.
- ‘Day boats’ – sail – typically no larger than 8m with a draft of <1.8m.
- Motor Cruisers – greater then 8m to 15m with a draft up to 1.5m draft
- Sailing boats - 8m to 15m typically up to 2.5m draft

We have identified a number of potential user groups and their respective vessel types. In general terms smaller lighter displacement vessels generate less load on the mooring. Figure 5.1 illustrates the wind areas, displacement and relative mooring loads for simple vessel configurations.

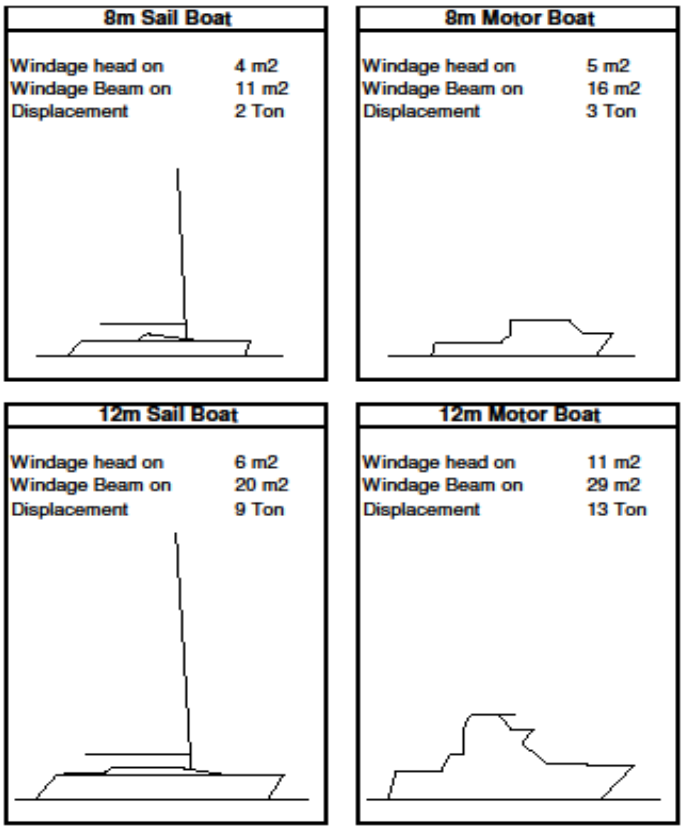

Figure 5.1 Vessel Loadings - TYHA Code of Practice

5.2 MOORING SYSTEMS

Having ascertained the ability to offer a range of moorings relative to vessel types, we have carried out a review of mooring systems. As part of this process it is useful to consider briefly the nature of conventional mooring systems.

Standard mooring systems are usually made up of dead weight anchor blocks, ground chains, and riser chains. The design of the system relies on a length of riser chain, designed to accommodate the highest level of tide for the tidal characteristics of the site. The effect at low tide is that the excess chain length, due its weight, lies on the seabed. As the mooring buoy moves around the anchor block due to the wind and tide conditions the excess chain is dragged around the seabed creating an area of disturbance around the anchor block.

The provision of permanent moorings in Studland Bay using such a standard arrangement would clearly not resolve the current concern about the possible effects of anchoring; indeed it would likely increase the concerns of those that have identified the potential for disturbance caused by anchoring activity to the seagrass. This because the moorings would be present regardless of whether a vessel was occupying the mooring and hence the chain moving across the bed.

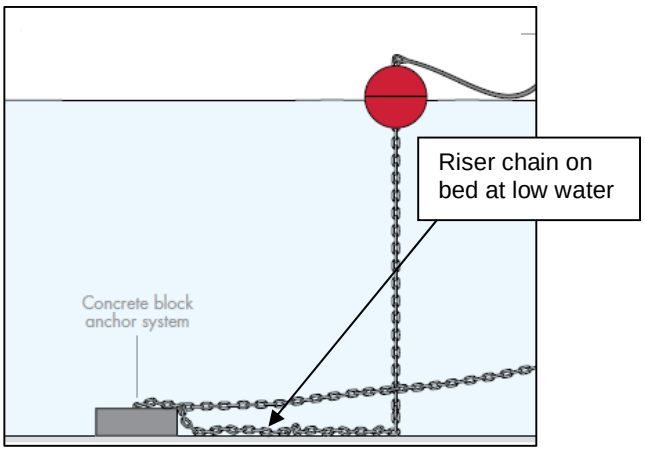

Figure 5.2 Conventional Anchor Chain Layout

The objective for this study was to identify a mooring system with the following key characteristics:

- Ability to securely moor a range of vessel types and capacities
- Minimum impact upon the seabed during deployment and maintenance – anchor element

§ Minimum impact upon the seabed during service – riser element

Our review of the market place identified the following range of eco moorings that are available:

5.2.1 Ezyrider

Ezyrider illustrated below – this system requires the installation of 2 No. ground weights linked to the mooring buoy by means of a chain and elastic riser system.

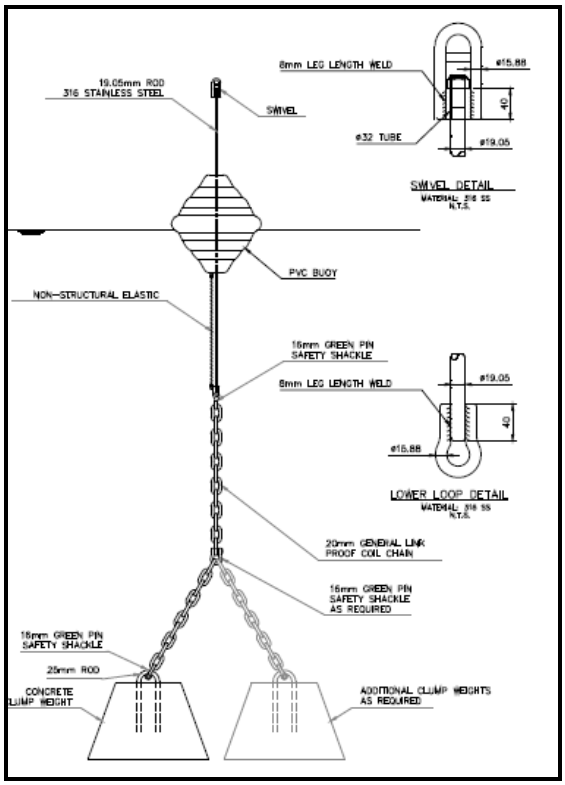

Figure 5.2 Ezyrider with ground weights

The benefits of the system are the minimum impact on the seabed of the anchor to buoy riser system. The shortfall in the system is the need for the installation of bulky ground weights. In poor ground conditions where a dead weight is essential, e.g. perhaps because the ground is very poor or very hard this solution would be viable. However when installed in large numbers in a sensitive location the combined effect of the area of seabed taken up by the anchor blocks would be significant. Low maintenance of the ground anchor however is a significant consideration.

There is an alternative anchor system that is provided with the Ezyrider known as the 'Offset Anchor System' utilising a three prong structure. This would be a more suitable system where the sensitivity of the seabed is a consideration, such as the study site.

Figure 5.2.1 - Ezyrider Alternative Offset Ground Anchor

5.2.2 Helix Anchor

This system utilises a corkscrew style anchor that is wound into the seabed creating minimal disturbance to the bed during deployment and service. It provides a simple and efficient securing system in the seabed. It requires appropriate ground conditions to both deploy the system – i.e. not too hard, and sufficient resistance from the ground to sustain the mooring loads. It is possible to extend the length of the anchor to suit the particular ground conditions.

The Helix system has been utilised for the provision of the VNAZ buoys and dialogue with Seastar the survey company who deployed the buoys confirms that the ground conditions were generally appropriate for use of the equipment. Further more detailed assessment of the ground conditions would be required to confirm the precise suitability and design requirements but at this high-level appraisal stage the helix anchor will be

taken forward as a preferred solution. An appropriate riser system is required in conjunction with this anchor system.

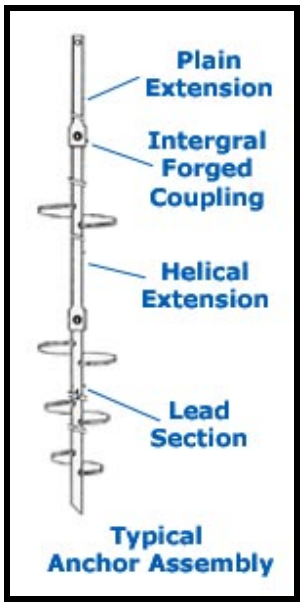

Figure 5.2.2 - Typical Helix anchor structure

5.2.3 Eco Mooring Rode

This mooring riser system negates the requirement for cumbersome, lengthy anchor chain in favour of an elastic tether that elongates under load and accommodates the range of tidal heights. This system can be used with a multitude of anchoring systems.

Figure 5.2.3 Eco Mooring Rode – Flexible Riser

5.2.4 Seaflex

Seaflex is an established provider to the UK market for alternative mooring systems. Essentially their product is a robust flexible riser from anchoring system to mooring system. Used in conjunction with an eco friendly anchoring system, Sea flex would provide a minimal impact solution during service.

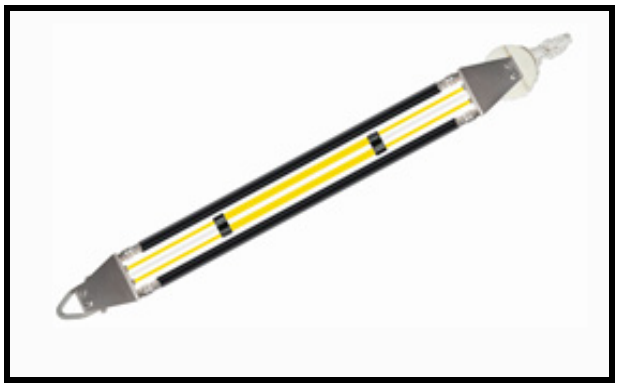

Figure 5.2.4 Seaflex Anchor System

5.3 MOORING NUMBERS

In order to establish the project costs and viability an assessment will need to be made of the number of moorings to be provided. The exact level of usage during peak periods is unclear although reports suggest in excess of 200 vessels on a busy day with some reports of 300 or more vessels. At a meeting in November 2010 hosted by the Marine Management Organisation with members of the Studland Bay Project Group statements regarding the overall number of anchorages in the area provide a rough estimate as follows:

> "approximately 7,500 vessels moor in the bay over the course of a year. The estimated number of recreational boat visitors to the bay was 15,000 to 25,000 per year".

For the purposes of establishing a viable business it would appear prudent to provide for a number of moorings that can be taken up on busy days, rather than accommodating absolute maximum demand. In this case some moorings would be used a very few times each year.

For the purposes of this high-level assessment a scheme that provided 200 moorings will be assessed. This would accommodate the level of peak usage associated with 7,500 vessel anchorages a year and allow for some increased activity due to the benefits of a secure anchorage.

5.4 MOORING MIX

It is clear that the available water area for mooring exceeds the maximum level of demand on any given day. The layout and extent of dedicated moorings will be informed by the physical site constraints, the preferred water areas to be occupied and water depth requirements of the vessels noted above. A further factor will be the nature of activity, short stay or potential overnight mooring. Consideration of these factors enables us to create an indicative mooring plan.

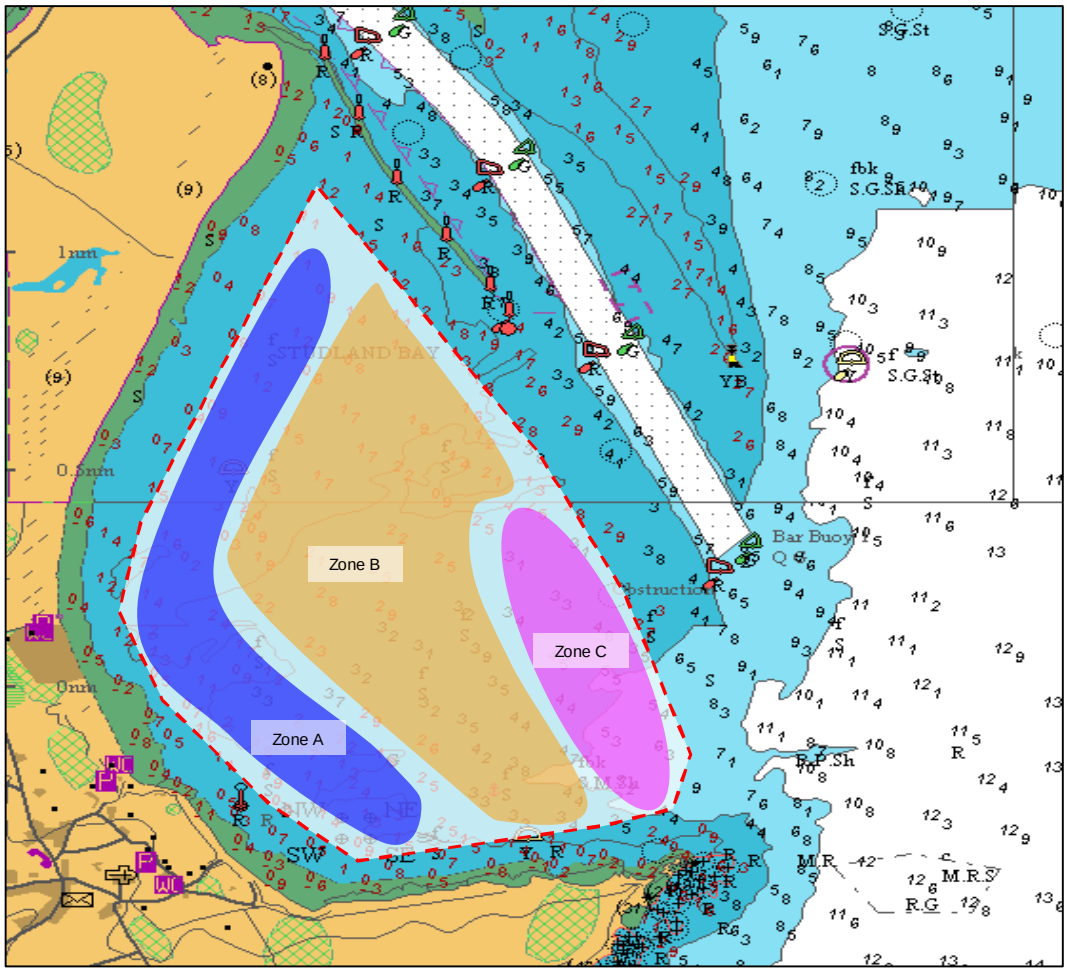

Figure 5.4 – Studland Bay Mooring Zones
Source Admiralty Chart Copyright UKHO licence No.11208

A broad assessment of the potential mooring zones for different sizes of vessel is provided in the Studland Bay zoning plan in Figure 5.4. The plan is offered up for illustration purposes only and it should be noted that it does not suggest the number of moorings that could be installed within the identified areas.

The water areas are broken down as noted below:

- Zone A – 35% of water area suitable for vessels of less than 9m - 108 Hectares
- Zone B – 50% of water area suitable for vessels 9m to 15m - 155 Hectares
- Zone C – 15% suitable for vessels greater than 15m - 46 Hectares

The mooring area required for a swinging vessel may be calculated by utilising industry standard data for a conventional swing mooring of 3 x water depth for the zone, however as we are promoting a flexible mooring system, the mooring area required is reduced by 50%. In addition industry standards dictate that not less than 2m should be allowed between each moored vessel.

As noted there is more than sufficient space to accommodate the required number of moorings in each of the zones. Applying the ratios of water space available within the zones, to the mooring categories to a total of 200 moorings the resulting mooring mix arises:

Mooring size	**Berth Numbers**	**Percentage**
Up to 8m	70	35%
8m to 15m	100	50%
15m to 25m	30	15%
Totals	**200**	**100%**

Table 5.4.1 – Approximate Mooring Mix

Interestingly the mix above determined by water area would sit comfortably with the typical mix of vessels from Poole Harbour and is therefore considered detailed enough at this high level assessment stage. In any event smaller vessels could readily take up larger moorings in slightly deeper water.

The final layout of moorings would be a matter for detailed consideration but it is suggested that a mooring mix outlined above but contained within the most sheltered part of the Bay would prove most attractive.

5.5 STRATEGY

The existence of a greater area of water space than is required to accommodate the provision of a dedicated mooring zone provides the opportunity to consider in light of the factors currently present in Studland Bay, how the remainder of the resource might be managed. The issues below will warrant further consideration:

- Creation of a dedicated 'Eco mooring' zone in the most desirable and sheltered area of the bay (south west corner) for approximately 200 vessels. The precise location and configuration could be adjusted to suit the seagrass density, however due to the design of the mooring system and the minimal impact upon the seagrass habitat; this might be a secondary consideration when identifying the location for the moorings. Indeed it might be argued that the dedicated mooring zone should be in the most sensitive area because that would effectively preclude "free- anchoring" in sensitive zones.

- Potential to create a dedicated 'overflow' anchorage to accommodate peak demands in a less desirable location that will cause minimum impact upon the existing seagrass meadows.

- Potential for expansion and re-designation of the VNAZ to a compulsory No Anchor Zone. This area might cover sensitive or recovering seagrass locations.

The premise of this indicative zoning would be to encourage the use of dedicated Eco moorings, whilst protecting the known and most dense seagrass zones along with the provision of continued 'free' anchoring within the Bay in areas that avoid or minimise concerns over impacts on the natural habitat created by anchoring. The boundaries of the overflow and No Anchor Zone could be adjusted to suit the evolving patterns of seagrass condition.

5.6 CAPITAL COSTS

5.6.1 Order of Costs

The market overview and mooring zones identified above and in Section 3 identify three potential mooring categories:

- vessels of less than 9m
- vessels from 9m to 15m
- vessels up to 25m

A high level assessment of the costs associated with a Helix anchor and Seaflex riser system suggest the following costs for the installation of a system of 200 moorings at the study site.

Fees	Unit	Quantity	Order of Cost	
Licenses and consents			£4,000	
Site Investigation			£18,000	
EIA & Appropriate Assessment			£23,000	
Professional Fees (@7% of works cost)			£51,800	
Legals - licences/agreements			£10,000	
Contingency @ 20%			£21,360	
Sub Total			**£128,160**	**£128,160**
Works				
General items	Sum		£1,000	
Prelims	Sum		£8,000	
Method related charges	Sum		£3,000	
Ground anchors Type <9m	No.	70	£24,290	
Ground anchors Type 9-15m	No.	100	£34,700	
Ground anchors Type >15m	No.	30	£19,050	
Sea flex to Buoy strop <9m	No.	70	£73,080	
Sea flex to Buoy strop 9-15m	No.	100	£109,100	
Sea flex to Buoy strop >15m	No.	30	£47,430	
Mooring Buoy <9m	No.	70	£19,110	
Mooring Buoy 9-15m	No.	100	£42,300	
Mooring Buoy >15m	No.	30	£12,690	
Installation to include:				
Locations by GPS	No.	200	£144,000	
Install ground anchors				
Connect risers, strop and buoy				
Contingency @ 25%	Sum		£134,438	
Sub Total			**£642,188**	**£672,188**
Project total costs				**£800,348**

Table 5.6 – Approximate Order of Costs

In order to arrive at this assessment of capital costs reference has been made to a number of suppliers and contractors for budgetary pricing to cover the supply and installation of equipment. At least two suppliers have provided costs with a good degree of consistency between the costs except in the area of installation. The best case costing provided assumes ideal ground conditions, considered unlikely, and the worst case costs are from a contractor/supplier with some knowledge of the site. Accordingly a mid-range cost has been assessed at £144k for installation and testing. Allowance has been made for the economies of scale arising from the high number of moorings to be provided.

Allowance has also been made for the necessary pre-commencement works required to secure the necessary consents and acknowledging that in all likelihood the sensitive location would demand a detailed Environmental Impact Assessment to and possible Appropriate Assessment under the Habitats Regulations to accompany the various consent applications. Regardless it is assumed that the consent process is relatively straightforward and not drawn out resulting in significant programme, but more importantly cost implications.

At this preliminary stage contingency sums might be considered high but this is a reflection of the level of uncertainty associated with various elements of the project e.g. ground conditions etc.

Review of Table 5.6 confirms indicative costs in the order of £800k ex.VAT to establish a dedicated mooring facility in Studland Bay.

5.6.2 Cost Sensitivity

The cost estimate above is based upon providing a number of moorings adequate to accommodate reasonable levels of demand. Significant increases or decreases in the number of moorings will not produce a pro-rata increase/decrease to costs.

Significantly decreasing the number of moorings will result in a worse than pro-rata effect on costs due to the following factors:

- Up-front costs of consents and project management etc. being spread over a fewer number of moorings
- Loss of the economies of scale currently factored in
- Site set-up and mobilisation costs being carried by lower value contract

It is worth noting that these factors will count against a phased introduction of eco-moorings.

Conversely increasing the number of moorings is likely to have a slightly better than pro-rata effect on costs. However further economies of scale would probably not be triggered unless there was a very significant increase in numbers and these are unlikely to be justified.

Increases/decreases in the provision of mooring numbers will have a very different effect on income generation and trading performance and these factors are discussed further below.

6. BUSINESS CASE ANALYSIS

6.1 GENERAL ASSUMPTIONS

In order to complete the model it has been necessary to make a number of assumptions as set out below:

1. The base business model is formulated around the delivery of a scheme of 200 eco-moorings. The impact of the presence of the existing moorings is ignored.
2. The income assessment assumes no income is lost through non-payment during the off-season and “free anchoring” can only take place once the dedicated moorings are fully occupied.
3. At the very least the mooring business will need to support the investment in the necessary equipment and the associated capital expenditure will need to be depreciated over the life of the equipment.
4. The business will also need to carry the cost of depreciation of other related fixed assets (e.g. work boats and any related plant and equipment).
5. The business will be expected to fund ongoing maintenance and replacement costs.
6. All normal trading and other expenses are to be borne by the business.
7. The model ignores the effect of inflation – any increases in tariffs / income or operating costs are over and above the effects of inflation. The subsequent DCF appraisal therefore, also ignores the effect of inflation and this should be borne in mind.
8. VAT is excluded on the basis that the mooring provider and operator will be able to reclaim VAT and it has no direct effect on the viability appraisal.

6.2 COMMERCIAL CONSIDERATIONS.

A significant and fundamental consideration for any business case analysis is whether the visitors to Studland Bay would accept the introduction of mooring charges for what has been a historically free anchorage. This is likely to be a

debate that will have both support and objection although the following observations are worthy of note:

- There is a mooring charging structure in place in many of the mooring areas noted in Section 3.

- Generally the secure moorings are taken up well before the anchorages are full. This is consistent with well documented trends in modern boat use confirming the demand for greater levels of security, service and convenience.

- A fixed mooring offers a greater degree of security to the moored vessel and requires less monitoring than an anchor when deployed.

- A high percentage of the vessels within the local and wider market area based in marinas and many of the modern day marina berth holders seldom utilise their anchor.

Whilst a dedicated mooring buoy will attract a sector of the market and undoubtedly some new customers to the area, who might currently be put-off by the need to anchor. A charging structure will inevitably not find favour with some existing users.

Whilst the moorings would undoubtedly attract a different market sector the level of demand is likely to remain due to the strength of the location.

The following sections will review the income generating potential and likely operating costs for a dedicated mooring zone.

6.3 INCOME GENERATION.

The income generating potential of the study site will be influenced by the tariff rates and demand/take-up of moorings. Income will be generated by both short stay and overnight moorings.

6.3.1 TARIFF STRUCTURE

In arriving at likely charging arrangements at the study site, a cross section of local market charges has been reviewed. The charging structures are on a 'like for like basis' i.e. they apply to swinging moorings where no shore side facilities are provided as a direct part of the "offer". However the extent of available facilities local to the moorings does vary by location and this does have some influence on the charges applied. Similar visitor mooring tariffs from the wider market area is noted in Table 6.3:

	Short Stay			Overnight		
Location	<8m	8m to 15m	15m to 25m	<8m	8m to 15m	15m to 25m
Medina River	£6.40	£12.00	£20.00	£9.60	£18.00	£30.00
Yarmouth Harbour	£6.50	£12.00	£21.00	£15.00	£26.00	£62.00
Beaulieu River	£10.00	£10.00	£10.00	£13.00	£17.00	£30.00
Lymington River	£5.00	£13.50	£21.00	£13.50	£22.00	£36.50
Poole Harbour	£5.00	£10.00	£20.00	£6.88	£12.90	£21.50
Mean Average	***£6.58***	***£11.50***	***£18.40***	***£11.60***	***£19.18***	***£36.00***

Table 6.3 Wider Market Area Mooring Tariffs

It can be seen that charges for short stay moorings are reasonably consistent across the sample sites above, with the exception of the Beaulieu River where a standard £10 is charged regardless of vessel size. This slightly distorts the average rates for short stay moorings. At this high-level appraisal stage the charges for Poole Harbour will be applied to assess the likely levels of income generation. This on the basis of its immediate proximity and the fact that the bulk of the short stay demand arises from this location

There is a much wider spread in the overnight mooring charges, particularly for the larger moorings. The very strong demand at Yarmouth brought about by the immediate proximity to the Town facilities and good water taxi service commands high tariff rates for the Harbour Commissioners moorings.

An approach that applies a 50% premium on the short stay rate would appear to sit comfortably with the general pricing structure and compare favourably with the average across the region, excluding Yarmouth.

It is to be noted that the continued ability to anchor free of charge is a significant factor when assessing a new charging structure. The value of a fixed mooring in this location would be recognised by a significant proportion of the market, however the extent of the site and vast areas where anchoring could take place free of charge dictates that charges will have to represent value for the convenience factor. In addition a phased approach to new charging structures may be adopted whereby the first 3 – 5 years are offered at a discounted rate as the scheme is accepted and utilised. The base line charging structure, excluding any discounts, utilised in the development of this high-level appraisal is noted below:

Short stay

- <8m vessel - £5.00
- 8m to 15m - £10.00
- 15m to 25m - £20.00

Overnight

- <8m vessel - £7.50
- 8m to 15m - £15.00
- 15m to 25m - £30.00

6.3.2 Income Assessment

Utilising the above charges we have been able to assess the income to be derived from the provision of 200 moorings at the study site. The annual number of moorings utilised by short stay and overnight customers has been derived by assessing the level of peak activity in the busiest months and projecting this to an annual total by using the typical seasonal spread of short stay and overnight visitor activity identified in Section 3.5. The assessment of peak month usage is provided in Table 6.3.1.

On the basis of the Table 6.3.1 assessment short stay usage would total approximately 8,000 vessels per annum and overnight usage of 2,500 vessels per annum. This assessment would exceed the figures for reported anchoring in Studland Bay which might reflect increased demand

for short stay, but particularly overnight moorings consequent of the improved security of the dedicated mooring.

Peak Months - short stay use			
Days	Average Occupancy	Total Moorings	Use
8 x weekends	55%	200	880
22 x weekdays	15%	200	660
		Total	1,540

Peak Months - O/night use			
Days	Average Occupancy	Total Moorings	Use
8 x weekends	25%	200	400
22 x weekdays	5%	200	220
		Total	620

Table 6.3.1 Peak Mooring Use

Applying the identified mooring rates to the above visitor numbers gives rise to the following income assessment:

Short Stay Income				
Mooring size	>9m	9-15m	15-25m	Total
Approx. split	35%	55%	10%	100%
Tariff	£ 5	£ 10	£20	
No. of vessels	2800	4400	800	8,000
Income	£14,000	£44,000	£16,000	£74,000

Overnight Income				
Mooring size	>9m	9-15m	15-25m	Total
Approx. split	35%	55%	10%	100%
Tariff	£7.5	£15	£30	
No. of vessels	875	1375	250	2,500
Income	£6,563	£20,625	£7,500	£34,688

It is worth noting that the above assessment sits comfortably with the assessed level of mooring provision. A significant increase in short-stay visitors would be predicated on a greater level of peak usage and hence a

requirement for the provision of more moorings. Whilst income would increase so would capital costs, maintenance and other operating costs.

As noted previously the current level of overnight visitor activity is unclear, in part because there is no readily available baseline data which can provide a benchmark for establishing the potential growth and future income potential.

6.3.3 Additional Income Generating Opportunities

It will clearly be necessary to establish some form of operating structure to address the management of the moorings and this may provide opportunities to offer additional services that might generate income and thus improve the viability of the mooring operation. Examples of potential additional services include:

- Water Taxi service – to bring users ashore
- On water retail sales – ice creams etc.

The assessment of water taxi income assumes 20% of visitors between June and September bring 2 visitors ashore, at a cost of £1.50 per person for a return trip.

6.4 OPERATING COSTS

6.4.1 Key Considerations

The operation and management of a mooring facility will have to include the following key considerations:

- Operating of the Mooring Service – fee collection, mooring allocation etc.
- Maintenance of the moorings, daily repairs and annual removal inspection & maintenance
- Insurance of the equipment
- Environmental conditions & waste management
- Pollution prevention

- Ship to Shore communications
- Risk Assessments

The main factors influencing operating costs and the assessment of these costs are discussed in the following sub-sections.

6.4.2 Operational Management

The operational management of the mooring system, the obligations on the mooring provider and requirement to secure payment and police non-payment it is clear that there needs to be a local operator in place to manage the day to day business. The provision of a mooring master based within the vicinity of the moorings with the ability to allocate moorings, meet and greet users, in a RIB or similar small manoeuvrable workboat is a tried and tested means of managing and administering visitor moorings in isolated locations.

With the introduction of a dedicated mooring facility and associated charging structure, there needs to be a mechanism in place to recover mooring fees from facility users. The moorings will be available 24 hours a day, 365 days per annum and the levels of activity will vary greatly throughout the year. Intuitively the income from moorings in the off-season and during quiet periods will not sustain a 24/7 or 365 day operation. It will however be possible to predict when the bulk of the activity is going to occur and mooring collection activities can focus on these periods. For example the main operating hours might be 0800 to 1600 hrs during the season (typically April to September) with longer hours to say 2000 hrs at weekends (July-Sept) and on Bank Holidays.

We have considered briefly other potential charging mechanisms appropriate to the location and proposals for capturing income when the facility is not manned:

- Utilise a ‘pay by phone’ system
- Create a ‘pre book’ and payment system via a dedicated web site

- Incorporate a seasonal diversification of services to local land based facilities, e.g. pub, car park, café, in order to manage, maintain and collect mooring fees outside of peak times
- Utilise the existing car park payment system utilised for the slipway charges

The added benefits and potential enhancement of such a service include the following:

- Ability to police and enforce the no anchor zone and the mooring strategy
- The opportunity to offer a water taxi service between visitor vessels and the shore
- Sale of basic provisions (gas, water, ice creams etc.)
- Protection and maintenance of the assets

The mooring business will have insufficient critical mass to establish itself as a stand alone operation. It is not considered viable to engage with mooring providers in Poole Harbour because of the slightly remote location and because it appears the operation could not support additional associated costs. For the sake of this assessment it is assumed that an existing operator in the area will consider taking on the additional resources to manage the mooring business, thereby removing the overheads associated with a stand-alone operation. A suitable solution might be to link with the National Trust operation at Studland Beach; the adjacent slipway, boat-park and car park operation would seem to fit well with the operation of a dedicated visitor anchorage. The relative proximity would also assist with the policing of mooring collection in the off-season. Other options might include the local pub or Parish Council.

Operating Costs identified in the business model assume that it is only the specific additional and stand alone costs required to manage the operation that fit into the mooring assessment business case. For example staffing costs reflect the costs of part-time administration and two summer seasonal berthing masters to manage the moorings on water during the period June to September.

6.4.3 Maintenance Costs

In order that the mooring facility provides continued service and secure moorings it will be necessary for a proper system of inspection and maintenance to be put in place by the operator. The associated costs need to be identified along with the ultimate life expectancy of the components and the associated replacement costs.

It is considered prudent, and advised by the majority of insurance houses to remove and inspect the mooring installation each year. Whilst there is not necessarily a direct replacement cost associated with this task, the time taken to remove, store and replace the mooring systems would be a significant factor and operational burden in terms of the overall financial viability of the proposal. At this stage it is assumed that the moorings could stay in situ throughout the winter.

The key components that make up the mooring system are noted below along with replacement costs and expected life during normal working conditions. This enables an annual assessment of maintenance costs:

Item	Av. life expectancy (Yrs)	Cost per unit (£)	Annual cost – 200 units
Helix/Offset anchor	20	£ 390	£ 3,902
Connecting shackles & Swivels	2	£ 150	£ 15,000
Flexible riser	15	£ 1,148	£ 15,307
Mooring Buoy	20	£ 371	£ 3,705
Works	Annual		£ 10,000
Survey and Inspection	Annual		£ 5,000
Total Annual Charge			£ 52,914

Table 6.4 – Annual Maintenance Costs

6.4.4 Insurance

A typical mooring establishment insurance cost is a function various factors including the replacement cost of the mooring equipment, value of plant and equipment, wage role and total turnover. On the basis of the preliminary assessments for this project an insurance premium of £5.9k.

6.4.5 Operating Costs Summary

For the purposes of this assessment it must be noted that the operating costs have been reduced to the lowest reasonable level, to ensure they are not overstated. The most significant operating cost element being the requirement to contribute to a maintenance fund to ensure adequate provision is in place to cover the essential maintenance programme.

6.5 VIABILITY APPRAISAL

The projected financial performance of the mooring business has been assessed based on the above key financial modelling considerations and have been taken forward to develop a 10-year business plan (Profit & Loss). In turn a Discounted Cashflow (DCF) analysis has been applied to assess the viability of the proposal.

The Base 10-year Business Plan is summarised in the Schedule at Appendix A.

6.5.1 Profit Performance

A modest trading profit is generated from Year 3 but throughout the life of the business plan this accumulated profit amounts to less than £20k. On an annual basis the income generated is generally just enough to off-set the significant annual maintenance costs, depreciation and limited personnel and general expenses.

The trading position outlined clearly supports the assessment that a stand-alone operation could not sustain itself.

Over the 10 years of the model accumulated losses amount to just £18k, demonstrating how marginal the business is and confirming that the business could not support the necessary capital expenditure.

In making the assessments outlined above, no consideration has been given to the minimum level of profit performance likely to be required for this opportunity to be considered an attractive proposition for the market.

The marginal level of profit performance, measured against what might be considered an optimistic assessment of operating costs, confirms the high

level of risk attached to such a business venture. Even if the necessary capital expenditure were gifted/grant funded this assessment suggests there is not a commercially viable opportunity present.

6.5.2 Principles of the Viability Appraisal

The focus in assessing the viability of an opportunity of this nature is generally on trading performance and cashflow generation. In order to make an assessment of viability, including the potential for contribution to the capital infrastructure costs a Discounted Cashflow (DCF) has been prepared. DCF is the preferred method of valuation because it recognises the asset value and also takes full account of the value of income streams derived from the future trading performance of the moorings.

For a credible and supportable DCF valuation there are a number of key information requirements. The assessment is sensitive to the discount rate used within the DCF and due consideration needs to be given to assessing the rate applied to the project to take account of the investors cost of capital, the yields being achieved in similar businesses and the risk/return relationship of the particular investment. It will be important to establish from the trading model that a business can be brought forward that will sustain itself as an ongoing trading entity and it can cover the costs of maintenance and asset replacement.

6.5.3 Discount Rate

In order to calculate the projects Net Present Value, it is necessary to make an assessment of the discount rate that should be applied within the DCF and it is worth noting that this model is highly sensitive to the discount rate used. The discount rate should equate to the Weighted Average Cost of Capital (WACC) of the funding provider and must also recognise the risks associated with the development. The analysis here uses a rate based upon a number of criteria being:

- Risk associated with the project
- Typical investment returns currently being achieved
- The current cost of debt funding
- Likely cost of capital of the equity provider

The DCF uses a discount rate of 12%.

6.5.4 Exit Value

In attempting to calculate the NPV of the project, it is necessary to make an assessment of the value of the future cash flow and profit performance generated by the business. This is undertaken by making an assessment of the business value at the end of the 10-year model to reflect either a theoretical sale of the business or the value of future cash flows.
This is usually calculated by applying an exit value yield to the average of trading profit from the latter years of the business model. In this case the marginal trading results in a very modest exit value of just £48k.

The exit value is highly sensitive to the exit yield rate used so due consideration needs to be given to this point, however as the exit lies some years into the future the DCF approach de-sensitises the exit yield factor to such an extent that it is not a critical factor in the overall project analysis.

Within the project DCF the exit rate of 12% is assumed to occur in relatively benign economic trading conditions, and it has been set at a rate realistic to the asset class and to reflect the lack of security of the income stream and risks associated with the development.

6.5.5 NPV and Internal Rate of Return (IRR)

Given the exit yield and discount rates outlined above the results of the viability appraisal are outlined below:

- NPV is negative at £-517k and this confirms that the project cannot achieve the “hurdle” rate of 12%
- IRR is negative at -11.4% - this result ignores the effect of the discount rate and provides a measure of the projects performance against the capital investment of £800k that is required to provide the mooring system.

A reduction in the discount rate to 7% will make only a marginal improvement to the NPV to £-499k, but it remains negative because the IRR of the project is so much lower than the discount/hurdle rate.

The above results confirm that even if brought forward as an adjunct to an existing operation the mooring arrangements could not support the necessary capital investment and cannot be considered to be a viable investment proposition. Furthermore there is a high-level of risk associated with such a proposal and the potential rewards are insufficient to suggest extensive commercial interest.

6.5.6 Sensitivities

In addition to the reducing of the discount rate appropriate sensitivities have been tested to reflect variations (improvements) in capital costs, occupancy and tariff rates. These sensitivities have been pitched at the very upper level of optimistic assessment of the projects financial performance. The results of the sensitivities are presented below:

Sensitivity	IRR	NPV
30% reduction in capital costs, e.g. by way of grant funding.	-2.8%	£-277k
Yarmouth Tariff Rates	8.4%	£ -116k
Increase to 10,000 short stay visitors	-0.7%	£ -347k
Yarmouth Tariff and 10,000 short stay visitors	14.5%	£ 84k

Table 6.5 Sensitivity Summary

As an illustration of the scale of the challenge required to bring forward a viable proposition review of Table 6.5 identifies that we have also looked at the potential of the combination of sensitivities. The greatest improvement to viability (IRR) comes from the application of Yarmouth Harbour tariff rates and then the 25% increase in short stay visitors. It is worth noting that it is considered unlikely that Yarmouth Tariff rates could be applied to the location and as noted previously an increase in short stay visitors would most likely require more moorings to be provided at an increased cost.

Notwithstanding the likelihood of delivering the combined improvements in trading it can be seen that it would take a combination of both sensitivities to achieve even a marginal investment proposition.

6.5.7 Reduced Mooring Numbers

We have also considered the implications of reducing the number of moorings provided to say 100 or 50. The broad adjustments required to the business plan are:

1. Reduced level of capital expenditure – but not on a pro-rata basis as noted previously i.e. worse then pro-rata due to start-up costs etc.
2. Better than pro-rata reduction in income. The income from overnight moorings income is retained at same level, because the occupancy is unlikely to be exceeded. However short stay income is reduced but by just 25% on the basis that fewer moorings will capture all of the available income except on the busiest days. However, the number of days when occupancy is at capacity or exceeded will be increased.
3. Maintenance expenditure is reduced on a pro-rata basis and depreciation is also reduced pro-rata to Capital expenditure.
4. Other operating costs are largely unaffected because they already reflect a minimum scale operation based around peak season operation.

The net result of the changes to the business plan is that the level of losses is increased by the reduction in mooring numbers, indicating that the reduced critical mass of the mooring provision adversely affects performance and viability.

7. SUMMARY & CONCLUSIONS

Against the background of the ongoing debate about the potential impact on protected species and habitats that might result from leisure vessel anchoring activities in Studland Bay, Marina Projects Ltd has been appointed by The Crown Estate to prepare a preliminary high-level study into the viability of introducing a dedicated eco-mooring facility in Studland Bay.

The summary of the study work and main conclusions can be summarised as follows:

1. During the prevailing weather conditions Studland Bay is the only sheltered anchorage between the Needles and Weymouth. The advantages of the location including but not limited to; the shelter; access ashore; attractive beach and natural setting; adequate water depths; limited tidal range; soft/good ground conditions; has long made it a desirable anchorage for leisure vessels.
2. There is an extensive leisure boating market across the central south coast of the UK for who Studland Bay will continue to appeal. As such it can be established that strong demand for a leisure mooring product would continue in such a prime location.
3. The predominant use would be for short stay (day visitor) activity. There are over 6,500 leisure vessels in close proximity to the site that can be considered to be the potential market for short stay. This “catchment” is most heavily influenced by the extensive leisure boat market in nearby Poole Harbour.
4. As a potential overnight stop-over Studland Bay would appeal to the wider market area across the central Solent and vessels transiting along the South Coast. The provision of dedicated and managed moorings would benefit this activity and might create an increase in activity due to the added security and ease of use arising from a mooring when compared to anchoring.
5. Trends in the market place unsurprisingly show a high level of seasonality from leisure vessel use, with peak activity levels during the period June to September.
6. It is clear that the available water area far outweighs the seasonal berthing demands and this indicates that it is probably the case that it is the desirability and protection of a particular zone and level of activity on a given day that dictates current mooring patterns. This might suggest that there is the potential to establish a mooring strategy with dedicated mooring areas in

addition to over-spill areas which could be provided in the slightly less desirable and less dense areas of seagrass habitat.

7. There are a range of potential mooring products suitable to create eco-friendly moorings in Studland Bay. For the purposes of this study a helical screwed anchor and "Seaflex" riser system has been identified as an appropriate solution. A dedicated mooring arrangement would need to provide differing capacity moorings to suit the likely vessel mix and be designed to suit the ground conditions.
8. In establishing a number of moorings to be provided we have considered the available information with regard to existing level of anchoring activity and the need to create a sustainable system that deals with busy periods but not absolute peak projected demand on any given day – this would not be economically sustainable. The total annual mooring number has been compared against the visitor activity trends across the region to establish an appropriate number of moorings to be provided. In the case of this assessment a total of 200 moorings are proposed.
9. Based on the provision of a mix of moorings to suit the market demands a capital cost estimate has been prepared to cover all elements required to bring the scheme forward, including the necessary level of consent related costs, professional fees and an appropriate level of contingency. A total capital cost estimate in the order of £800k is currently assessed.
10. A significant and fundamental consideration for any business case analysis is whether the visitors to Studland Bay would accept the introduction of mooring charges for what has been a historically free anchorage. This is likely to be a debate that will have both support and objection.
11. On the basis that the strong demand, advantage of the location and benefits of a dedicated mooring can sustain charges we have established a level of charges comparable with the local and wider market charges for similar facilities, but one that reflects the nature of the mooring that will be offered.
12. Based upon the identified tariff charges and an assessment of visitor activity that can be generated from 200 moorings we have identified the income generating ability of the potential mooring arrangements. This assessment has also considered additional income generating opportunities.
13. At this stage there is a question mark over the level of overnight activity as no existing data is readily available to provide a benchmark against which the potential activity levels and income generation can be measured. Further analysis and data in this area would serve to refine this preliminary appraisal.

14. It is evident that the income and seasonality issues will not sustain a year round management function or a stand-alone operation. Our assessment of the business case has assumed the minimum level of operating costs associated with the management of the moorings being taken on by an existing local operator. This might be considered to be an optimistic assessment of the likely levels of operating costs.
15. The most significant operating cost is likely to be associated with the annual maintenance provision for the moorings. A detailed assessment of other operating costs including but not limited to staffing, insurance, depreciation, general expenses etc. has been made. The summary of the business case analysis is that income levels are unable to sustain the basic level of operating costs and the business would accrue losses throughout the early years of the operation.
16. The marginal level of profit performance, measured against what might be considered an optimistic assessment of operating costs, confirms the high level of risk attached to such a business venture. Even if the necessary capital expenditure were gifted/grant funded this assessment suggests there is not a commercially viable opportunity present.
17. The resultant business case has been taken forward into a viability appraisal which concludes that even if brought forward as an adjunct to an existing operation the mooring arrangements could not support the necessary capital investment and cannot be considered to be a viable investment proposition. In other words the accrued losses will not off-set the ongoing operating costs and sustain the required level of capital investment.
18. A number of sensitivities have been reviewed to consider the impacts of reduced capital costs, increased tariffs and improved levels of activity. This sensitivity assessment concludes that even with a combination of the most optimistic sensitivities a dedicated mooring facility is at best a marginal proposition.
19. Furthermore there is a high-level of risk associated with such a proposal and the potential rewards are insufficient to suggest extensive commercial interest.
20. A review of a reduced scheme of mooring provision e.g. to say 100 or 50 moorings confirms that the business performance and viability is adversely affected by the reduced critical mass.
21. Should it be considered worthwhile to refine this assessment further more detailed analysis is required of the capital costs, ground conditions and the likely level of overnight visitor activity.

APPENDICES

APPENDIX A – BASE BUSINESS PLAN

Studland Bay Visitor Berthing Viability assessment		Year 1 2012 £	Year 2 2013 £	Year 3 2014 £	Year 4 2015 £	Year 5 2016 £	Year 6 2017 £	Year 7 2018 £	Year 8 2019 £	Year 9 2020 £	Year 10 2021 £
Short Stay Income		74,000	74,740	75,487	76,242	77,005	77,775	78,552	79,338	80,131	80,933
Overnight Income		34,688	35,728	37,157	39,015	39,405	39,799	40,197	40,599	41,005	41,415
Water Taxi		3,062	3,215	3,375	3,409	3,443	3,478	3,512	3,548	3,583	3,619
Misc.Retail		600	630	662	668	675	682	688	695	702	709
TURNOVER		**112,349**	**114,313**	**116,682**	**119,335**	**120,528**	**121,733**	**122,951**	**124,180**	**125,422**	**126,676**
Salaries		(16,090)	(16,412)	(16,740)	(17,075)	(17,416)	(17,590)	(17,766)	(17,944)	(18,124)	(18,305)
National Insurance		(2,092)	(2,134)	(2,176)	(2,220)	(2,264)	(2,287)	(2,310)	(2,333)	(2,356)	(2,380)
Pension Costs		(483)	(492)	(502)	(512)	(522)	(528)	(533)	(538)	(544)	(549)
Protective Clothing		(1,250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)
Training		(500)	(500)	(300)	(300)	(300)	(300)	(300)	(300)	(300)	(300)
PERSONNEL & RELATED		**(20,414)**	**(19,788)**	**(19,968)**	**(20,357)**	**(20,753)**	**(20,955)**	**(21,159)**	**(21,365)**	**(21,573)**	**(21,784)**
		No Property Costs Assumed - contained within principal operator									
PROPERTY & RELATED											
Equipment Related Contracts & Repairs		(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Annual Maintenance Budget		(52,914)	(52,914)	(52,914)	(52,914)	(52,914)	(52,914)	(52,914)	(52,914)	(52,914)	(52,914)
Equipment Fuel		(1,100)	(1,100)	(1,100)	(1,100)	(1,100)	(1,100)	(1,100)	(1,100)	(1,100)	(1,100)
Mooring Equipment Depn		(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(32,000)
Plant & Equip Depreciation		(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)
EQUIPMENT & RELATED		**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**	**(89,014)**
Local Advertising & Marketing		(500)	(500)	(500)	(500)	(500)	(500)	(500)	(500)	(500)	(500)
Legal Fees / Other Prof Fees and Services		(300)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Telephone/on-line booking service		(450)	(600)	(600)	(600)	(600)	(600)	(600)	(600)	(600)	(600)
General Insurance		(5,870)	(6,046)	(6,227)	(6,414)	(6,607)	(6,805)	(7,009)	(7,219)	(7,436)	(7,659)
GENERAL EXPENSES		**(7,120)**	**(8,146)**	**(8,327)**	**(8,514)**	**(8,707)**	**(8,905)**	**(9,109)**	**(9,319)**	**(9,536)**	**(9,759)**
TOTAL OVERHEADS		**(116,548)**	**(116,948)**	**(117,310)**	**(117,885)**	**(118,474)**	**(118,874)**	**(119,282)**	**(119,698)**	**(120,123)**	**(120,557)**
TRADING PROFIT		**(4,199)**	**(2,635)**	**(628)**	**1,450**	**2,054**	**2,859**	**3,669**	**4,482**	**5,299**	**6,120**
Trading Profit to Turnover Ratio		-4%	-2%	-1%	1%	2%	2%	3%	4%	4%	5%
Less - Capex		(816,000)									
Add back - depreciation		34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000
Cashflow:		(786,199)	31,365	33,372	35,450	36,054	36,859	37,669	38,482	39,299	40,120
Normalised Profit capitalised at:	**12.0%**										**47,577**
Cashflow for discounting (EBITDA)		(786,199)	31,365	33,372	35,450	36,054	36,859	37,669	38,482	39,299	87,696
NPV of cashflow at:	**12.0%**	**(516,556)**									
Internal Rate of Return		**-11.4%**									