



FISH MONITORING - 2017

Southern IFCA Report



Acknowledgements

The surveys feeding into this piece of work cover a large area and prove to be very time consuming and have the potential to be resource heavy. It would not be possible for officers to undertake these without the assistance we regularly receive from staff/Officers from the National Trust at Newtown Harbour and on Brownsea Island, Yarmouth Harbour Master, the Isle of Wight Estuaries Project, Dorset and Hampshire and Isle of Wight Wildlife Trusts, Natural England, the Fleet and Chesil Reserve, the Poole and District Sea Angling Association, Langstone Harbour Board, Bournemouth University and the Environment Agency.

Data from this report is available on request. Please contact the IFCA directly for more information.

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1. Background

During 2017, Southern IFCA continued its Fish Monitoring program aimed at understanding the importance of the estuaries and sheltered harbours within the district to juvenile fish populations. This report continues the time series set out in 2016 as well as further developing the programme with the inclusion of additional previously un-surveyed sites. The surveys were led by the IFCA, but officers were joined by staff from the Environment Agency, Dorset Wildlife Trust, Hampshire and Isle of Wight Wildlife Trust, Natural England, the Isle of Wight Estuaries Project, Yarmouth Harbour Master, the National Trust, the Fleet and Chesil Reserve and recreational sea anglers.

1.1. Importance of Estuaries and Harbours

Estuaries and coastal ecosystems are known for their high productivity and biodiversity, providing ecosystem services such as sustenance and coastal protection (Barbier *et al.*, 2011). Fish are a major component of aquatic communities and are a good general indicator of ecological status and habitat health. Fish species in the coastal and near shore areas vary from juvenile species utilising relevant habitats as nursery areas as well as those which remain in the nearshore area for their full life cycle.

The aim of the surveys to date has been to collect quantitative information on juvenile and resident fish communities presently occupying these 'essential fish habitats'. The information may be used in conjunction with future survey data to understand seasonal and annual changes in the fish communities over time. This could be used to help to inform any necessary further management to take its best form in the future as well as provide a better understanding of the fish species utilising the survey areas.

1.2. Survey Areas

In 2017, a total of 13 sites within 7 different estuaries/systems were surveyed. The sites are shown in the table 1 below. The intention was to survey each site in both June and October. This was achieved at all sites except the Medina, where finding a suitable site with access proved difficult, and Keyhaven, where storms meant that access to one of the sites was not possible in October.

Table 1 – Southern IFCA survey sites		
Hampshire	Keyhaven	Shore Road
		Hurst Spit
Isle of Wight	Yarmouth Harbour	The River Yar
		Yarmouth Pier
	Newtown Harbour	Shalfleet Quay
		Newtown River
	Medina	Arctic Rd
Dorset	Poole	Lychett Bay
		Brownsea Island
	Fleet	Ferry Bridge
		Langton Hive
	Christchurch	Mudford Spit
		Wick Hams



Figures 1.2.1-1.2.2 Distribution of Survey sites in the East and West of the Southern IFCA district

1.3 Methodology

In order to feed into the Southern IFCA time series, the same methodology and standard operating procedure as the previous years have been followed.

At each successful site two seine nets were set. All sites but one was targeted at high tide, typically due to the nature of the Harbours as most dried out to mud at low tides; the exception was Yarmouth Pier which was not within a tidal harbour. A 43 metre seine deployed from the shore either using a small open vessel, or by foot, in order to form a semi-circle and bringing the net back to the shore. Although techniques varied slightly between sites to adapt to local conditions/requirements, once set they remained the same at that site for consistency. Metadata including water temperature, salinity and local weather conditions were recorded for each site. Figures 1.3.1 and 1.3.2 show the different methods of deployment setting the net.



Figures 3.1.1-3.1.2 Deployment of the Seine net by Officers in a vessel and on foot.

Where possible, the methodology used replicated that used by the Environment agency and other partners (e.g. Langstone Harbour and Sussex IFCA) in order to make the results comparable to neighboring harbours, estuaries or water bodies. A degree of deviation from this protocol was necessary to make reaching the wide range of sites achievable, particularly in the use of two

survey types (e.g. Beam trawl, fyke nets etc). For the Southern IFCA surveys, only a single capture methodology (seine netting) was used.

2. Results

The surveys took place between the 7th of June and the 30th of June 2017, and the 12th of October to the 25th of October 2017. Surveys were attempted at all of the sites in June, however it was decided that the Medina was not to be taken forward into October due a suitable site not being found and one of the Keyhaven sites, Shore Road, was not feasible in October due to a storm surge causing localised flooding at the site to be surveyed.

In total 44 seines were undertaken across 13 different sites targeting 7 different estuaries. In total 2612 fish were sampled and over the course of the surveys 33 different species were observed and recorded, adding to a Southern IFCA species list now reaching 34.

Table 2 summarizes the haul data for all the sites, and table 3 shows the numbers of five of the most abundant species in 2017 in spring and autumn. Summaries for each estuary have been produced in sections 3-8. Table 4 gives a species list for all the sites.

	Month	Number of Species Haul 1	Number of Species Haul 2	Average Number of Species per haul	Total Number of Species	Number of Individuals Haul 1	Number of Individuals Haul 2	Average Number of Individuals per haul	Total Number of Individuals	Most Abundant Species
Lychett Bay	June	3	5	4	6	44	92	68	136	Sand Goby
	October	8	7	7	8	271	202	236.5	473	Common Goby
Brownsea Island	June	13	13	13	16	100	127	113.5	227	Sand Goby
	October	8	10	9	12	893	302	597.5	1195	Sand Smelt
Ferry Bridge	June	5	5	5	7	89	106	97.5	195	Common Goby
	October	4	4	4	5	44	25	24.5	69	Bass
Langton Hive	June	4	5	4.5	5	269	353	311	622	Common Goby
	October	9	9	9	10	155	200	255	355	Common Goby
Medina	June	3	1	2	3	27	12	33	39	Sand Smelt
Yarmouth Harbour	June	3	5	4	6	13	29	27.5	42	Sand Smelt
	October	7	6	6.5	8	121	154	198	275	Sand Smelt
Yarmouth Pier	June	6	4	5	6	18	40	29	58	Herring
	October	4	4	4	6	90	13	51.5	103	Bass/Sand Smelt
Shalfleet Quay	June	2	2	2	4	26	2	27	28	Bass
	October	5	5	5	5	43	39	62.5	82	Common Goby
Newtown River	June	5	5	5	6	43	39	62.5	82	Common Goby
	October	7	6	6.5	7	395	291	540.5	686	Sand Smelt
Shore Road	June	4	3	3.5	4	37	12	43	49	Unidentified Fry (Golden Grey Mullet)
	October	NS	NS	NS	NS	NS	NS	NS	NS	NS
Hurst Spit	June	4	5	4.5	5	51	181	141.5	232	Bass
	October	6	5	5.5	6	179	181	269.5	360	Bass
Mudford Spit	June	7	6	6.5	7	40	51	65.5	91	Sand Goby
	October	5	4	4.5	9	188	406	297	594	Sand Smelt
Wick Hams	June	6	6	6	6	133	360	313	493	Thin Lipped Mullet
	October	6	5	5.5	7	336	165	250.5	501	Thin Lipped Mullet

Spring					
Sand Smelt	Common Goby	Sand Goby	Bass	Thin Lipped M	Thick Lipped Mullet
177	388	279	211	416	12
Autumn					
Sand Smelt	Common Goby	Sand Goby	Bass	Thin Lipped M	Thick Lipped Mullet
1906	147	155	776	472	93
2017					
Sand Smelt	Common Goby	Sand Goby	Bass	Thin Lipped M	Thick Lipped Mullet
2083	535	434	987	888	105

Table 2 (above) Summarized haul data

Table 3 (left) 5 most abundant species in 2017 – seasonal comparison

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Table 3 (left) 5 most abundant species in 2017 – seasonal comparison

Table 4 – Presence (1)/ Absence (2) species list for all sites surveyed.

		Yarmouth				Newtown				Medina	Keyhaven			Poole				The Fleet				Christchurch			
Species		River Yar		Yarmouth Pier		Shalfleet Quay		Newtown River		Arctic Rd	Shore Road	Keyhaven Spit		Lychett Bay		Brownsea		Ferry Bridge		Langton Hive		Christchurch Spit		Wick Hams	
Common Name	Scientific name	June	October	June	October	June	October	June	October	June	June	June	October	June	October	June	October	June	October	June	October	June	October	June	October
Anchovy	<i>Engraulis encrasicolus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Bass	<i>Dicentrarchus labrax</i>	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0
Black Bream	<i>Spondylusoma cantharus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Brill	<i>Scophthalmus rhombus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Dragonet Reticulated	<i>Callionymus reticulatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
European eel	<i>Anguilla anguilla</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Flounder	<i>Platichthys flesus</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	0	0
Garfish	<i>Belone belone</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Gilthead bream	<i>Sparus aurata</i>	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0
Goby - Common	<i>Pomatoschistus microps</i>	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1
Goby - Sand	<i>Pomatoschistus minutus</i>	1	1	0	0	0	1	0	1	0	0	0	0	1	1	1	1	0	1	0	1	1	1	0	0
Goby - Two spotted	<i>Gobiusculus flavescens</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Goby - Black	<i>Gobius niger</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Goby - Rock	<i>Gobius paganellus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Herring	<i>Clupea harengus</i>	0	1	1	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Long spined sea scorpion	<i>Taurulus bubalis</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Mullet - Golden Grey	<i>Chelon aurata</i>	1	1	0	0	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0	1	1	1	1	0
Mullet - Thick Lipped	<i>Chelon labrosus</i>	1	1	0	0	1	0	1	1	0	0	1	1	0	1	0	0	1	1	0	1	1	0	0	1
Mullet - Thin Lipped	<i>Liza ramada</i>	0	1	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	1	1	1	1	1	1	1
Pipefish - Greater	<i>Syngnathus acus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0
Pipefish - BroadSnout	<i>Syngnathus typhle</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Plaice	<i>Pleuronectes platessa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Pollack	<i>Pollachius pollachius</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Sandeel	<i>Ammodytes tobianus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Sand Smelt	<i>Atherina presbyter</i>	1	1	0	1	0	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	0	1	0	0
Shanny	<i>Lipophrys pholis</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Sole	<i>Solea solea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
Solenette	<i>Buglossidium luteum</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Sprat	<i>Sprattus sprattus</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
Stickleback - Three spined	<i>Gasterosteus aculeatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Stickleback - Fifteen spined	<i>Spinachia spinachia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Wrasse - Ballan	<i>Labrus bergylta</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0
Wrasse - Corkwing	<i>Symphodus melops</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0

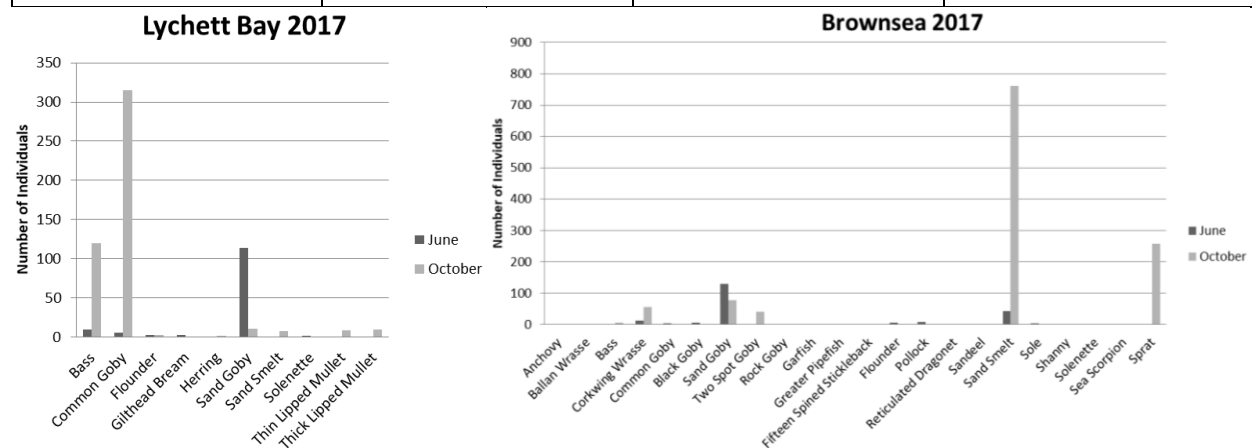
2.1. Poole Harbour

Poole is a natural harbour on the South coast containing large areas of intertidal saltmarshes and mudflats. Poole Harbour is designated a Site of Special Scientific Interest (SSSI), a SPA and a Ramsar site. Poole harbour has been surveyed by Southern IFCA conforming to the time series standards for two years, but was used as a pilot for Southern IFCA seine net surveys for an addition year prior to this.

The two sites sampled as part of this survey are Lychett Bay and Brownsea Island. These represent two very different habitats, the first a sheltered bay in the North of the Harbour with a freshwater influence from the Sherford River and the second, a site near the entrance to the Harbour, subject to more 'marine' conditions and strong tidal currents.

Table 5 identifies the fish caught at both sites in Poole during June and October. Figure 3.1 shows the numbers associated with these species.

Table 5 – Species caught in Lychett Bay and at Brownsea Island 2017			
Lychett Bay		Brownsea	
June	October	June	October
Bass	Bass	Ballan Wrasse	Anchovy
Common Goby	Common Goby	Corkwing Wrasse	Ballan Wrasse
Flounder	Flounder	Common Goby	Bass
Gilthead Bream	Herring	Black Goby	Corkwing Wrasse
Sand Goby	Sand Goby	Sand Goby	Sand Goby
Solenette	Sand Smelt	Two Spot Goby	Two Spotted Goby
Thin-lipped Mullet	Thin-lipped Mullet	Rock Goby	Garfish
Thick-lipped Mullet	Thick-lipped Mullet	Greater Pipefish	Greater Pipefish
		Fifteen Spined Stickleback	Reticulated Dragonet
		Flounder	Sand Smelt
		Pollock	Shanny
		Sandeel	Sprat
		Sand Smelt	
		Sole	
		Solenette	
		Sea Scorpion	



Figures 3.1.1-2 - Number of individuals caught in Lychett Bay and at Brownsea Island

A large number of sand smelt were caught at Brownsea in the October survey, this represented the most of any one species caught at a single survey site during 2017. Brownsea, as in previous years, has proven to be the most diverse site in the survey schedule, as well as that with the most individuals, although as with this year, typically this has always been a result of high catches of single species (often sandeel, sand smelt, sprat or herring) and are often the result of sampling through a shoal. The higher catches at Brownsea could also be a result of the seine deployment. Brownsea experiences the most significant shore profile and drop in depth, and the seine is typically extended to its full height unlike at the shallower sites.



Figures 3.2.1-2 – Poole Harbour survey sites – left – Lychett Bay, Right - Brownsea Island

There is variation in the species caught between the two sites. Those in Lychett Bay such as bass and mullet, as well as some of the juvenile flat fish are typical of what may be expected in the more estuarine conditions further into the Harbour. The diverse list of species captured at Brownsea, both in June and October, represent more typically marine species. The anchovy caught on the October survey was a first for Southern IFCA and Brownsea and possibly the first survey record for Poole Harbour, although fishermen have reported occasional catches.



Figures 3.3.1-4 - Selection of fish species found at Brownsea Island, one of the more diverse sites of the Southern IFCA surveys. (Top left heading clockwise) – Corkwing Wrasse, 15 Spined Stickleback, Long Spined Sea Scorpion and Anchovy

2.2 Keyhaven

Keyhaven represents a sheltered area to the West of the Solent. Hurst Spit protects a large areas of mudflats and saltmarshes known as 'Keyhaven Marshes'. Keyhaven falls within the Solent Maritime SAC and the Solent and Southampton Water SPA. It is also designated as a RAMSAR site and forms part of a SSSI. The survey sites at Keyhaven are focused around the largest of the three major creeks, 'Mount Lake', running alongside the spit. One survey site is on the spit surveying into the main 'Mount Lake' channel, and the other is on the mudflats adjacent to saltmarsh on the Western edge of the Harbour.

Keyhaven Spit - 2017

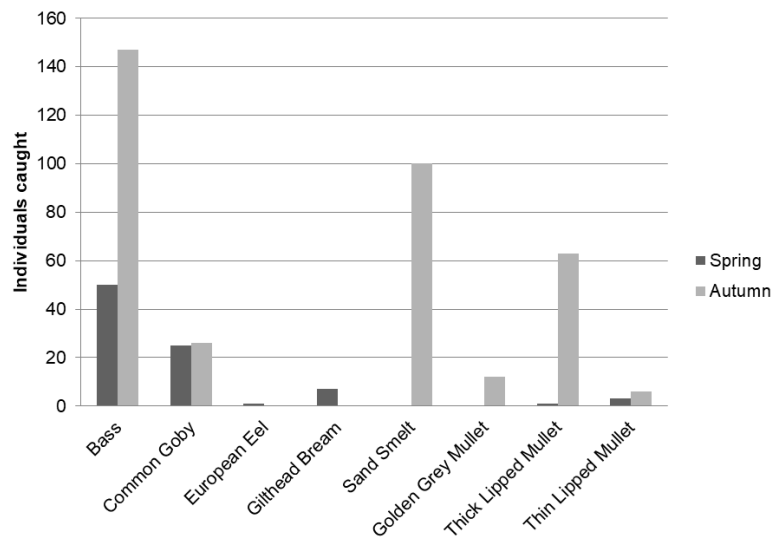


Figure 4.1 - No. of individuals caught at Hurst Spit

Table 6 – Species caught at Keyhaven			
Hurst Spit		Shore Road	
<i>Spring</i>	<i>Autumn</i>	<i>Spring</i>	<i>Autumn</i>
Thin-lipped Mullet	Bass	Bass	N/A
Thick-lipped Mullet	Golden Grey Mullet	Golden Grey Mullet	N/A
European Eel	Thick-lipped Mullet	Common Goby	N/A
Bass	Thin-lipped Mullet	Herring	N/A
Gilt head Bream	Sand Smelt		N/A
Common Goby	Common Goby		



Figure 4.2.1-2 Survey sites at Keyhaven - Hurst Spit (left) and Shore Rd (right).

Table 6 shows the species caught and figure 4.1 highlights their numbers in spring and autumn. Unfortunately due to a strong storm surge at the time of surveying, only one site was available to be surveyed in the autumn in 2017.

The species list and the number of fish caught at the two sites would indicate that the shore road site was less diverse however a single survey only in spring is not enough data to come to this conclusion.

At the only seasonally comparable site, on Hurst Spit, more fish were caught in October than in June. Bass, common goby and thick and thin-lipped Mullet were found during both surveys here and Bass was the most abundant species in both spring and autumn.

In the spring, one of the interesting species caught was the European eel (*Anguilla anguilla*). Across the surveys, the European eel was only captured at one other site, Christchurch. The life history of the European Eel is complex, however those captured by Southern IFCA were yellow eels, identifiable by location, size, colouring and eyes. These reside in fresh, brackish and estuarine environments as they become sexually mature, before migrating back to the ocean as silver eels to spawn. Although found in many waters surrounding the British Isles, they are found more often in Estuaries in spring and autumn.



Figure 4.2 - European Eel (*Anguilla anguilla*)



Figure 4.3 – Juvenile Gilthead Bream (*Sparus aurata*)

Also found at this site were gilthead bream (*Sparus aurata*). These were observed in the spring at a number of sites, and at Hurst Spit multiple bream were found in both Seines in the spring. Gilthead bream are typically found at depths of 0-30 metres but are often found in estuaries or brackish water bodies during spring (Henderson, 2014), as none were found in the Autumn, this description fits with the findings of the survey.

Also found at this site in the spring were a large number of unidentifiable fry. These were normally amongst weed in the net, as most were small enough to pass through the mesh. These were measured

and their presence noted, but as they couldn't be identified have not been included in the summary.

2.3 Christchurch Harbour

Christchurch is a natural harbour in Dorset, fed into by two rivers, the Avon and the Stour. 2017 was the first year the IFCA has surveyed in Christchurch Harbour. The Southern Flank of the Harbour is bounded by Hengistbury Head to the South-West and Mudeford Spit to the South-East. Two sites were identified as pilot survey sites based on ease of access and varying habitats. These were a site off the Spit at Christchurch Harbour and a second site further into the Harbour to the West, near a place called Wick Hams.

Table 7 Shows the species caught for Christchurch and Figure 5.1 highlights the numbers of each in spring and autumn.

Table 6 – Species caught for Christchurch			
Mudeford Spit		Wick Hams	
Spring	Autumn	Spring	Autumn
Ballan Wrasse	Bass	Bass	Bass
Bass	Brill	Common Goby	Common Goby
Deep Snouted Pipe Fish	Common Goby	European Eel	European Eel
Flounder	Dover Sole	Gilthead Bream	Sand Smelt
Sand Goby	Flounder	Golden Grey Mullet	Thin-lipped Mullet
Golden Grey Mullet	Golden Grey Mullet	Thin Lipped Mullet	Thick-lipped Mullet
Thin-lipped Mullet	Sand Goby		
Thick-lipped Mullet	Sand Smelt		
	Thin-lipped Mullet		
	Deep Snouted Pipe Fish		
	Lesser Sandeel		

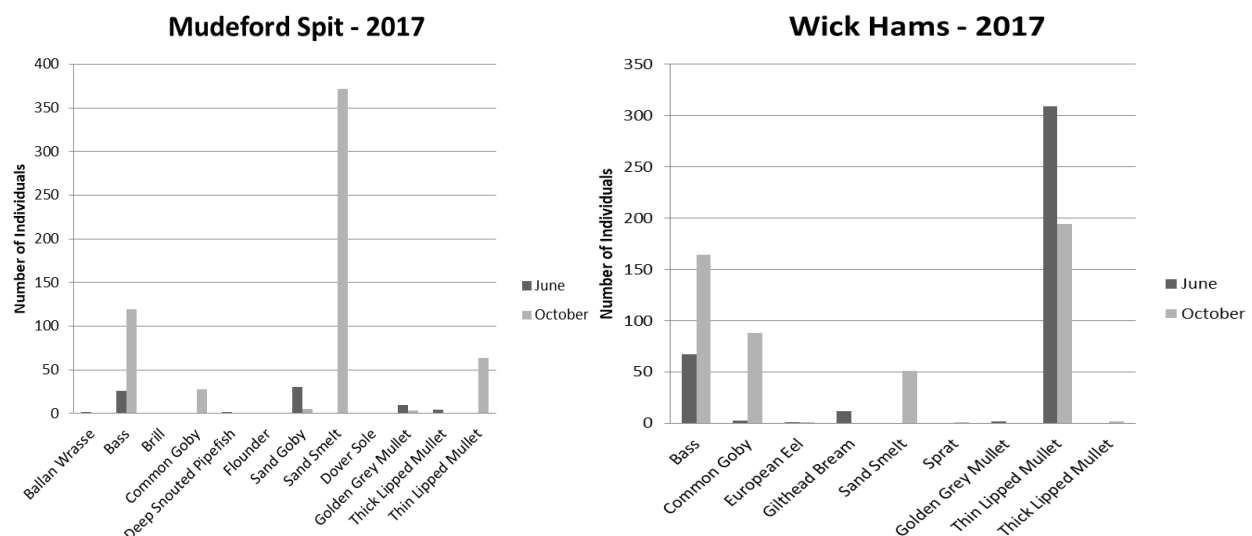


Figure 5.1 – No. of individuals caught split into species for Mudeford Spit and Wick Hams

The Harbour produced some of the largest catches observed in our surveys with significant numbers of mullet and bass caught. The Mudeford Spit site proved to be fairly diverse in the species caught with a variety of flat fish including flounder, dover sole and brill, as well as large number of mullet and bass, particularly during the October surveys.



Figure 5.2.1-2 Examples of some of the flatfish found at Mudeford Spit – (left) Brill – (*Scophthalmus rhombus*), Right – Sole (*Solea solea*)

The surveys at the Wick Ham also produced high number of fish in June and October, particularly of bass and thin-lipped mullet. The June surveys producing over three hundred thin-lipped mullet was the highest number of mullet encountered during the surveys in 2017. There was an apparent seasonal differences in the size of the mullet surveyed at Wick Hams. In October the thin-lipped mullet averaged 59mm in length, this varies to the average of 93mm earlier in the year in spring. However, in June there were a number of juvenile mullet that were too small to be identified (between golden grey, thin-lipped and thick-lipped). Where spawning occurs in the Winter, it may be that the juvenile first year mullet are only large enough to be caught/identified by the autumn surveys and before that either are not caught in as large numbers or were unable to be identified as thin lipped mullet due to the distinguishing features not being clear in the juveniles.

There was also a large number of sand smelt observed in October at both sites, and none in the June surveys. This was observed elsewhere at other survey sites where sand smelt were typically more prevalent in the autumn months and is consistent with other surveys in the area (Rudd and Swift, 2015; MacCallum, 2016) .



Examples of the species found at Wick Hams – Left European eel (*Anguilla Anguilla*), found both in Spring and Autumn, Right - juvenile thin lipped-mullet (*Liza ramada*)

2.4 The Fleet

The Fleet is the largest example of a lagoonal habitat in England, with a large inland water body created by the shingle barrier of Chesil Beach, through which water percolates as well as entering through a narrow channel towards Portland. A low freshwater input produces fully saline conditions. The fleet is designated as a SSSI, SAC, SPA and Ramsar site. It is also a Bass Nursery Area. During 2016 the IFCA sampled the Fleet at a number of sites in collaboration with the Environment Agency. During 2017, and moving forwards, core sites of Ferrybridge and Langton Hive were selected. Ferrybridge, lying at the seaward entrance of the lagoon is typically subject to regular tidal influences and more saline conditions, whereas Langton Hive is situated towards the western end of the Fleet and, although has saline influences, is more sheltered from wave and tide activity.

Table 7 gives species caught and their numbers are highlighted in Figure 6.1

Table 7 – Species caught in the Fleet surveys 2017			
Ferrybridge		Langton Hive	
June	October	June	October
Bass	Bass	Common Goby	Bass
Brill	Black Bream	Deep Snouted Pipefish	Common Goby
Common Goby	Sand Smelt	Gilthead Bream	Greater Pipefish
Gilthead Bream	Shanny	Thin-lipped Mullet	Flounder
Sand Smelt	Thin-lipped Mullet	Three-spined Stickleback	Plaice
Thick Lipped Bass			Sand Goby
			Sand Smelt
			Golden Grey Mullet
			Thin-lipped Mullet
			Thick-lipped Mullet
			Three Spined Stickleback

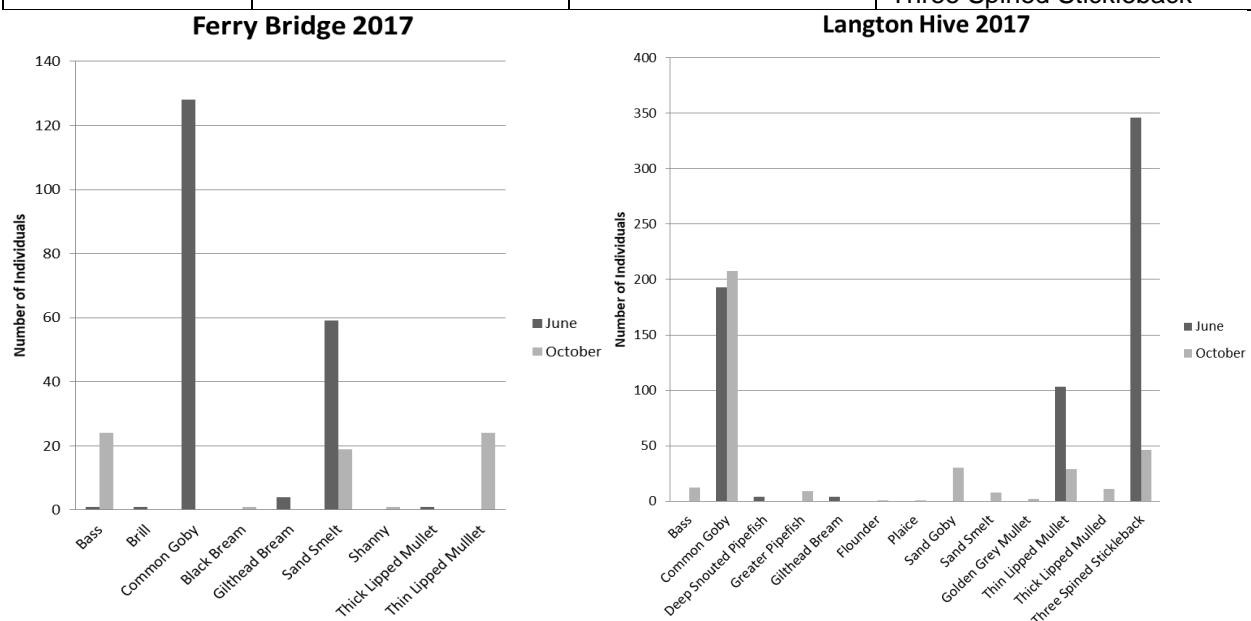


Figure 6.1 – No. of Individuals caught at Langton Hive and Ferrybridge



More fish were sampled and a higher diversity of species was observed at Langton Hive, with 13 different species. Both showed higher numbers in June which bucks the trend observed elsewhere where higher catches were observed in the October surveys.

There is a clear difference between the species caught at the two different sites, which is likely a reflection on the difference in habitats as well as the relative shelter afforded

to the different sites, with the Ferrybridge site being closer to the lagoon entrance, where it is likely to be exposed to stronger currents and sits on a firmer coarser sediment than Langton Hive, which is further into the estuary and represents a more sheltered muddy sediment, close to a seagrass bed.



Figure 6.3.1-2 Fish caught at Ferry Bridge included – left - juvenile bream (*Sparus aurata*) right - juvenile brill (*Scophthalmus rhombus*) (right)



Figure 6.4.1-2 Fish sampled at Langton Hive included left - over 300 (June) three-spined stickleback (*Gasterosteus aculeatus*) and right - broadnose pipefish (*Syngnathus typhle*) captured at the Langton Hive site

A survey first for Southern IFCA was the three-spined stickleback caught in large numbers (346 in June) at the Langton Hive site. Although recorded in previous Environment Agency surveys in the Fleet, the species has not been observed at any of the other Southern IFCA survey sites. This could be due to the unique habitat provided by the Fleet when compared to the other sites, and may be a result of nearby seagrass beds.

2.5 Newtown Harbour

Newtown is a natural harbour on the north-western shore of the Isle of Wight. It is fed by a number of rivers/streams including the largest, Newtown River. The harbour is highly designated, included in the Solent Maritime SAC, the Solent and Southampton Water SPA, is a SSSI and a National Nature Reserve. The Harbour is owned and managed by the National Trust, who have assisted IFCA officers with fish surveys in the Harbour since 2016. The Harbour is made of a number of channels and creeks, and the focus of the 2017 surveys was the shore opposite Shalfleet Quay and the shore near the entrance to the Western Haven.

Table 8 highlights the species caught and Figure 7.1 shows the numbers of each species caught.

Table 8 – Species sampled at Shalfleet Quay and Newtown River			
Shalfleet Quay		Newtown River	
June	October	June	October
Bass	Bass	Bass	Bass
Common Goby	Common Goby	Common Goby	Common Goby
Golden Grey Mullet	Herring	Sand Smelt	Herring
Thick Lipped Mullet	Sand Smelt	Sprat	Sand Goby
	Golden Grey Mullet	Golden Grey	Sand Smelt
	Thin-lipped Mullet	Thick-Lipped Mullet	Golden Grey Mullet
	Thick-lipped Mullet		Thick-lipped Mullet

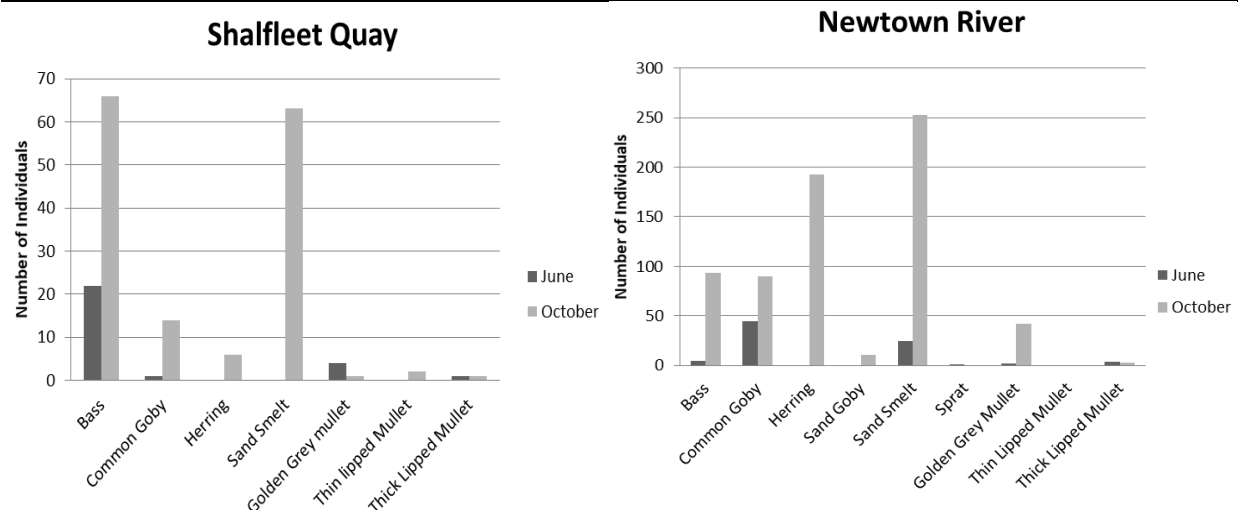


Figure 7.1 – No. of individuals sampled at Shalfleet Quay and Newtown River

The species list for each site does not vary significantly, with both sites over the two seasons catching mullet species, bass, gobies and sand smelt. This is likely due to fairly similar habitat types, where the only suitable areas in the Harbour were two spots of fairly firm shore.



Figure 7.2 The net being set at Shalfleet with the assistance of the Newtown Harbour Master



Figure 7.3 - Golden grey mullet (*Chelon aurata*) – exhibiting the clear golden colouring on the operculum which differentiates it from the other grey mullet species. These were the most abundant species of mullet at Shalfleet during the June surveys and at Newtown River during October.

At both sites the number of fish captured in the June surveys was less than in October. During both seasons the Newtown River site had higher catch rates, particularly in the autumn where sand smelt (253) herring (193), bass (93) and common goby (90) were all found in greater abundance than any fish at Shalfleet Quay. Although the habitats were similar, the difference in numbers could have been a result of the setting of the net, more algae was observed around the Shalfleet site, making hauling the net in more challenging and may have allowed more fish to escape.



Figure 7.4 - Examples of the (left) herring (*Clupea harengus*) and sand smelt (*Atherina presbyter*) caught in high numbers at the Newtown River site

2.6 Yarmouth Harbour and Yarmouth Pier

Southern IFCA have been sampling in the River Yar since 2016. This has been possible with assistance from staff from the Isle of Wight Estuary Partnership and the Yarmouth Harbour Master. The river Yar is protected under a number of designations. It falls within the Solent Maritime SAC and the Solent and Southampton Water SPA. It is also a Site of Special Scientific Interest. A Yarmouth Harbour vessel is used to deploy the Seine. The survey site is found south of the road bridge at Yarmouth, and the substrate is typically muddy in an area near to saltmarsh. The areas of deployment is surrounded by small channel in the mud and has proven to be a productive survey site over the periods visited.

The Yarmouth Pier site was added this year as a stakeholder engagement event associated with 'The Piers tale' project, but was repeated as it represented an interesting comparison to the River Yar, a site less than 500m away, but which varied significantly in habitat type. The site also falls within the Solent Maritime SAC and the Solent and Southampton Water SPA and the survey takes place just inshore of a seagrass bed. The site is immediately adjacent to Yarmouth pier which it was anticipated would be used by numerous fish species as shelter.

Table 9 provides the species sampled at the Yar and at Yarmouth Pier. Figure 8.1 provides the numbers of individuals split into species found at each.

Table 9 – Species sampled at the River Yar and Yarmouth Pier			
River Yar		Yarmouth Pier	
<i>June</i>	<i>October</i>	<i>June</i>	<i>October</i>
Bass	Bass	Ballan Wrasse	Ballan Wrasse
Common Goby	Common Goby	Corkwing Wrasse	Corkwing Wrasse
Sand Goby	Sand Goby	Herring	Bass
Golden Grey Mullet	Herring	Long Spined Scorpion Fish	Sand Smelt
Thick-lipped Mullet	Golden Grey Mullet	Shanny	Pollock
Sand Smelt	Thick-lipped Mullet	Pollock	
	Thin-lipped Mullet		
	Sand Smelt		

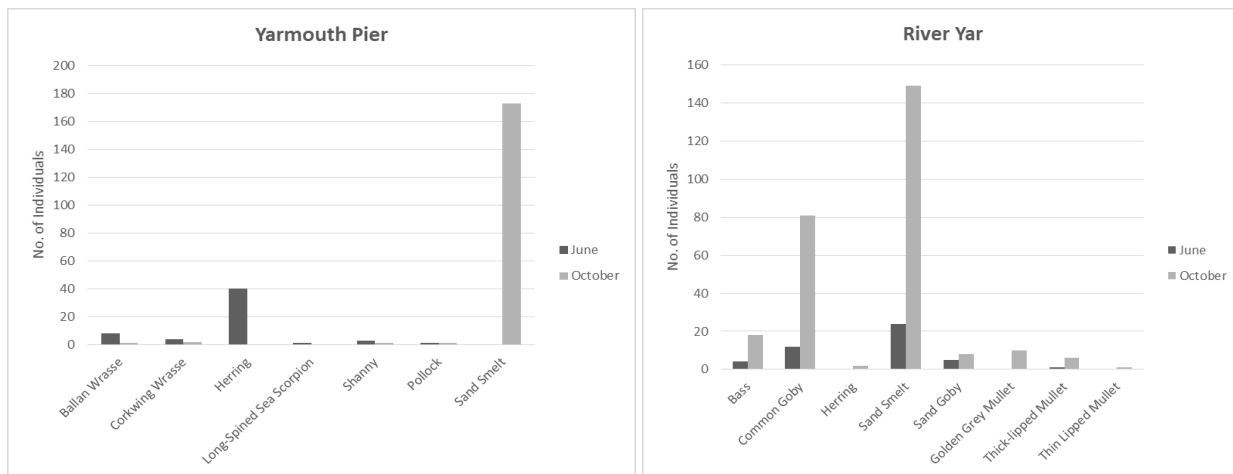


Figure 8.1 – No. of individuals sampled at the River Yar and Yarmouth Pier in 2017, split by species



Figure 8.2.1-2 – The River Yar (left) and Yarmouth Pier (right) survey sites

The species caught in the River Yar were similar between the June and October surveys. Due to the nature of the site being in an estuarine environment the occurrence of mullet species and bass was expected and has been observed in previous years. Three species of grey mullet are common in the UK coastal waters, Golden Grey, Thick-lipped and Thin-lipped. Across June and October all three were observed in the Yar.



Figure 8.3.1-2 – Species caught both in June and October in the Yar, left - juvenile bass (*Dicentrarchus labrax*) right - Thick-lipped grey mullet (*Liza ramada*)

The Yarmouth Pier Site showed far fewer individuals sampled in general, except during the October survey, when a large haul of Sand smelt were captured. Otherwise, in June haul one only had 17 fish, and haul 2 only had slightly more due to a larger amount of herring (37) being caught.

The difference between the Yar and the Pier is clear with the species typically associated with Estuaries such as mullet and bass found in less numbers at the Pier, and species not found in the majority of the Southern IFCA estuary surveys, such as pollock or the wrasse. The site represents one of the few sites, as well as Brownsea Island, where the sea scorpion was sampled. The sea scorpion is more typical of Stoney or hard shores, not those found within the River Yar or many of the other sheltered muddy harbours within the estuary.



Figure 8.4.1-2 – Species caught both in June and October at Yarmouth Pier, left – Shanny (*Lipophrys pholis*) right – Corkwing Wrasse (*Symphodus melops*)

3 Time Series

Only four sites have been surveyed multiple times and as a result, only those can be considered in the current time series. At this point, only Lychett, Brownsea, Ferry Bridge and Yarmouth Harbour can be compared. As mentioned previously, this time series is currently a single year in, more analysis will be possible in upcoming years when more data is available, but below briefly summarizes the two years data.

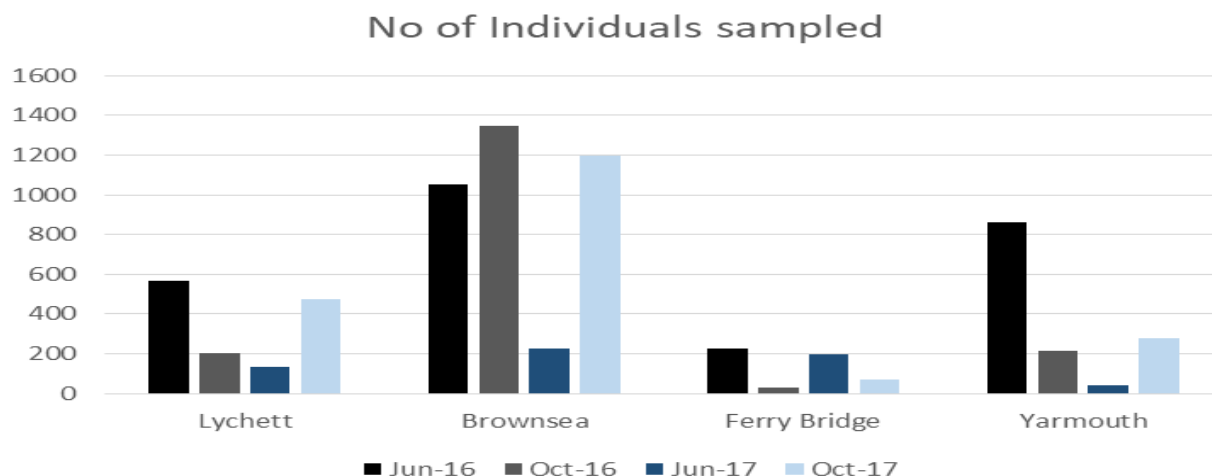


Figure 9.1 – Annual comparison of no. of individuals sampled, split by site and by survey season.

Table 10 – Number of fish/Number of Species caught in 2016/2017 at the four time series sites.

Variable	Year	Season	Lychett	Brownsea	Ferry Bridge	Yarmouth
Number of Fish	2016	Jun-16	565	1055	227	864
		Oct-16	204	1347	30	216
	2017	Jun-17	136	227	195	42
		Oct-17	473	1195	69	275
	2016	Jun-16	6	16	7	6
		Oct-16	8	12	5	8
Number of Species	2017	Jun-17	8	9	6	3
		Oct-17	3	12	5	5

This shows that 2017 typically had less fish sampled with a total of 4508 fish recorded in 2016 and 2612 sampled at the five sites in 2017. Further sampling will begin to develop a pattern and poor or particularly successful years may be easier to differentiate.

4 Bass

As there is little long-term analysis that can be undertaken due to the time series being in an early stage, some consideration has been given to a single species, European sea bass (*Dicentrarchus labrax*). Bass were caught at 20 out of 24 of the 2017 surveys (both seasons), the highest along with common goby, and was the most abundant fish overall apart from the common goby. Bass have an interesting life cycle, and although as adults they tend to spend time offshore, juveniles (up to 4-5 years old) tend to reside in shallow coastal lagoons and Estuaries (Jennings and Pawson, 1992). A number of areas within the Southern IFCA district have been designated as bass nursery areas (MAFF, 1990) since 1990. The nursery areas were designed to afford extra protection to bass stocks and the areas in which the juveniles of the species typically reside. Of the survey sites Poole Harbour and the Fleet are designated bass nursery areas, but it is anticipated that other areas fulfil these functions.

The below table provides the number of bass and the average bass length caught for each survey site. Bass were found within each Estuary system, if not at each site. All areas showed higher numbers sampled in autumn than spring, though the size was typically smaller in the autumn. This could be a result of the year 0 bass being more abundant in the estuaries at this time or reaching a size where it is more easily sampled by the fishing method.

		Yarmouth													
		Lychett Bay	Browns ea	Ferry Bridge	Langton Hive	h Harbour	Yarmouth Pier	Medi na	Shalfleet Quay	Newtown River	Shore Rd	Keyhaven Spit	Mudford Spit	Wick Hams	
Number of Bass	June	9		1			5		5	22	5	11	50	22	119
Average Bass Length (mm)		168.6		142.0			161.0		129.2	117.4	208.8	123.1	106.1	176.1	78.3
Number of Bass	October	170	5	24	12	18	9		65	93		147	50	164	
Average Bass Length (mm)		98.8	77.2	126.2	108.8	80.6	100.8		96.8	67.7		62.2	92.5	51.5	

At a number of the different sites, especially those with fewer records of bass, the average size for measurement can be skewed by the single adult bass. Using the age classes defined by the most recent Solent Bass survey (Brown and Armstrong, 2016), the following estimates have been

made of the age of the bass from the 2017 IFCA seine net surveys, differentiating the year 0, year 1 and the years 2 to 4, and 4+ as % of the main catch, based on the values calculated by Brown and Armstrong (2016). The Solent Bass survey typically takes place in September so only the autumn seines have been included, this is typically where most O-Group sea bass are encountered in Estuaries (Aprahamian and Barr, 1985). The age classes are determined each year based on measurements and scale samples, they vary slightly each year and when the 2017 data is available this dataset will be updated, although little variation is anticipated. Across the entire set of surveys in autumn, 88.7% were estimated in the 0 year class, having spawned in early 2017, 9.3% were estimated at year 1 (2016 year class), 1.9% in the 2-4 year ages class (2013-15) and 0.2% above 5 years and over. This shows that the survey sites are utilized in the district, particularly in their first year.

Autumn estimated year classes for Bass from the Southern IFCA surveys											
	Lychett Bay	Ferry Brownsea Bridge	Langton Hive	Yarmouth Harbour	Yarmouth Pier	Shalfleet Quay	Newtown River	Keyhaven Spit	Mudford Spit	Wick Hams	
Year 0 %	87.3	100.0	25.0	100.0	94.4	77.8	73.8	93.6	100.0	84.0	100.0
Year 1 %	5.1	0.0	75.0	0.0	5.6	22.2	23.1	6.4	0.0	10.0	0.0
Year 2-4%	7.6	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	6.0	0.0
Year 4+	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0

5 Further Work

The fish monitoring programme is still in an early stage and as the dataset is added to it will be of more value. It is anticipated that, resources depending, at least those sites which were sampled in 2016 (Yarmouth, the Poole sites and the Fleet sites) will be continually monitored to further develop the time series. Also, resource depending, Newtown Harbour and potentially others can be considered as possible additions, depending on available officer time during the survey season. As the dataset grows, comparisons to other datasets will be possible, such as other fish surveys or the seasonal sea surface temperature, and this may allow for more detailed analysis.

Currently, the data provides an interesting look at some of the typical species found within the estuaries of the district. It fulfills the aim of highlighting the utilization of these areas by fish species and their importance in this function.

Other agencies use these types of surveys to achieve other goals, and part of trying to collect data in a standardized way is to enable data to be used for various purpose. The data is available to any interested parties. Officers will also be exploring the best methods of sharing this data, e.g. MEDIN, marine recorder etc.

A brief consideration as to whether the current system could be used for more ambitious analysis in its current form, for example the Transitional Fish Classification Index (TFCI) to consider water quality, was undertaken. However it became clear that, the additional resource requirement to adequately survey each estuary to achieve this purpose was considered too great, and would require a significant amount more surveying in each estuary to adequately apply the index. Due to water quality not being the driver of the Southern IFCA surveys, it was considered that the application of the TFCI not be a priority.

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Annex I – Species caught to date in Southern IFCA Surveys

<i>Species</i>	
<i>Common Name</i>	<i>Scientific name</i>
Anchovy	<i>Engraulis encrasicolus</i>
Bass	<i>Dicentrarchus labrax</i>
Black Bream	<i>Spondyllosoma cantharu</i>
Brill	<i>Scophthalmus rhombus</i>
Dab	<i>Limanda limanda</i>
Dragonet - common	<i>Callionymus lyra</i>
Dragonet Reticulated	<i>Callionymus reticulatus</i>
European eel	<i>Anguilla anguilla</i>
Flounder	<i>Platichthys flesus</i>
Garfish	<i>Belone belone</i>
Gilthead bream	<i>Sparus aurata</i>
Goby - Common	<i>Pomatoschistus microps</i>
Goby - Sand	<i>Pomatoschistus minutus</i>
Goby - Two spotted	<i>Gobiusculus flavescens</i>
Goby - Black	<i>Gobius niger</i>
Goby - Rock	<i>Gobius paganellus</i>
Herring	<i>Clupea harengus</i>
Short spined sea scorpion	<i>Myoxocephalus scorpius</i>
Long spined sea scorpion	<i>Taurulus bubalis</i>
Mullet - Golden Grey	<i>Chelon aurata</i>
Mullet - Thick Lipped	<i>Chelon labrosus</i>
Mullet - Thin Lipped	<i>Liza ramada</i>
Pipefish - Greater	<i>Syngnathus acus</i>
Pipefish - BroadSnout	<i>Syngnathus typhle</i>
Plaice	<i>Pleuronectes platessa</i>
Pollack	<i>Pollachius pollachius</i>
Sandeel	<i>Ammodytes tobianus</i>
Sand Smelt	<i>Atherina presbyter</i>
Shanny	<i>Lipophrys pholis</i>
Sole	<i>Solea solea</i>
Solenette	<i>Buglossidium luteum</i>
Sprat	<i>Sprattus sprattus</i>
Stickleback - Three spined	<i>Gasterosteus aculeatus</i>
Stickleback - Fifteen spined	<i>Spinachia spinachia</i>
Wrasse - Ballan	<i>Labrus bergylta</i>
Wrasse - Corkwing	<i>Symphodus melops</i>