Managing Hand Working Fishing Activity

A Focus on Bait Digging

Supplementary Report for the B&PSC – Information & Evidence

Version 1: May 2019

Contents

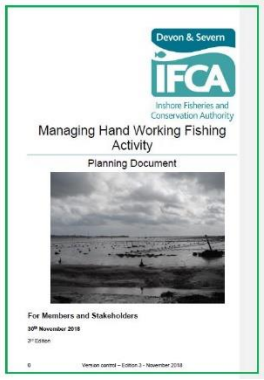
Version Control

Version	Date	Comments
Version 1:	29/04/19	At time of circulation to members and publication on the D&S IFCA website, D&S IFCA is awaiting some responses from Natural England regarding submitted Habitats Regulation Assessments and Marine Conservation Zone Assessments.

1. Aim of this Supplementary Report

This supplementary report has been prepared for members of the Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) Byelaw and Permitting Sub-Committee (B&PSC). This supplement contains embedded information (hyperlinks) to additional information and is therefore best suited for reading in electronic format.

This supplementary report forms part of the overarching plan for the review of the management of Hand Working Fishing Activity that has been previously discussed by the B&PSC and subsequently implemented by officers.



The overarching plan highlights why the review is being conducted and over what time frame.

The first phase of the overarching plan was to focus on the use of crab tiles. Information and evidence relating to crab tiles was documented in a supplementary report presented to members of the B&PSC in February 2019.

The second element of the overarching plan is to focus on the activity of bait digging and its current and potential future management.

This supplement report summarises the D&S IFCA baseline information (as recorded on 26th April 2019) relating to the activity of bait digging and has been compiled to assist members with discussions and decision making throughout an on-going process. It is possible that additional information and evidence will be presented to members during 2019.

Process and Decision Making:

Members can review and discuss any elements of the collated information and evidence relating to bait digging. The report sets out information and evidence that may be of use for members to establish a position on how the activity potentially could or should be managed. The observations and discussions of members will be recorded and will be referred to when more formalised discussions relating to “options for management” take place later in 2019.

It is envisaged that the duties (153 and 154) as set out in the Marine and Coastal Access Act 2009 can act as discussion drivers. The exact wording has been simplified and set out below:

153 Management of inshore fisheries

a) Seek to ensure that exploitation is carried out in a sustainable way
b) Seek to balance social and economic benefits of this fishing activity with the need to protect the environment from the effects of the fishing activity
c) take any other steps considered necessary by the Authority to make a contribution to the achievement of sustainable development of the fishing activity
d) seek to balance the needs of the different people who conduct bait digging in the District

154 Protection of Marine Conservation Zones

a) The authority must seek to ensure that the conservation objectives of any MCZ are furthered

2. An Overview of Bait Digging

Recreational Sea Angling is popular throughout the Devon and Severn IFCA District and, as a result, so is the collection of bait species.

Bait digging for polychaete worms is by far the most common activity, with two main species targeted; blow lug (*Arenicola marina)* and king ragworm (*Alitta virens).*

Bait digging is carried out by using forks to dig for the target species on intertidal mud and sandflats, it primarily takes place in estuaries such as the Severn, Tamar, Plym and Exe, but does also occur on beaches, for example in Torbay.

Figure 1: Bait digger working on the Severn Estuary

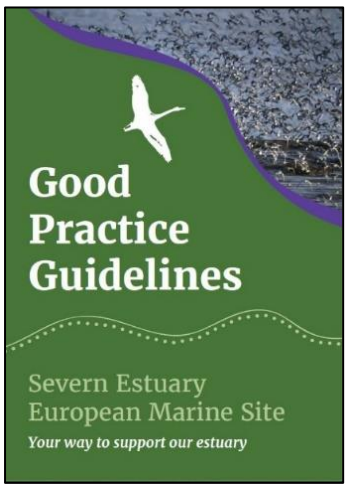
Many of these areas are Marine Protected Areas (MPA) and it is the IFCA's responsibility to assess whether bait digging will impact the habitats and birds using these sites

Other bait collection activities which are popular in the Devon & Severn IFCA District include "crab tiling" - the collection of shore crabs using man-made shelters.

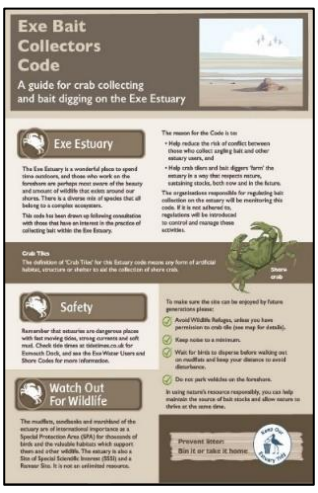
3. How is bait digging currently managed?

Bait digging is not currently managed in the D&S IFCA's District via Byelaws, however there are some voluntary codes of conduct that do help to manage this fishing activity within the District. The voluntary code of conducts/good practice guides that exist within the Exe Estuary and the Severn Estuary are good examples and have been embedded (hyperlinked) below:

Severn Estuary



Exe Estuary



Other voluntary codes of conduct exist in the UK and a selection are displayed in Section E of the D&S IFCA website Resource Library. There is potential that additional voluntary measures can be considered for other areas within the D&S IFCA's District apart from the Exe and the Severn Estuary. There is also potential that D&S IFCA could consider the use of additional control measures implemented via a new byelaw.

Voluntary Codes of Conduct

The voluntary code of conduct on the Exe Estuary was updated in 2018 to include bait digging. The code was produced by Exe Estuary Management Partnership and South East Devon Habitat Regulations Partnership. D&S IFCA remains supportive of this initiative and our contact details along with details of Byelaw 24 (more relevant to crab tiles), are printed on the leaflet. The leaflet is available on-line and is shared locally through Tourist Information Centre; libraries and local business. The Exe Estuary partnership holds a database of crab-tilers but has had more difficulty compiling the contact details of those that dig for bait.

The Exe Bait Collectors Code sets out the following:

- Refuge areas within the Exe estuary which should be avoided if possible
- Highlights the European and National designations of the Exe estuary and the important habitats and wildlife areas.
- Avoid waste, only take bait for planned trips
- Do not dig near eelgrass beds
- Back-fill holes to restore the estuary and to make it safe for other users
- Avoid collecting rare or unusual bait such as rare bristle worm
- Avoid digging near slipways, moorings and commercial fisheries

The Good Practice Guidelines for the Severn Estuary European Marine Site has been developed by the Association of Severn Estuary Relevant Authorities (ASERA). This organisation has identified that disturbance from some recreational activities can affect the protected birds, habitats and fish in the estuary.

The guide is relatively large and has mixed content including advice for multiple activities such as walking, dog walking, cycling, bird watching, boating and horse riding. The purpose of the guidelines is to encourage the sustainable use of the estuary and its coastline, providing an enhanced and safer environment for recreational users and visitors to enjoy.

Advice is also included for recreational angling and bait digging. Regarding bait digging, the key advice is to:

- **Limit the take of worms**
- **Do not remove green spawning worms or king rag**
- **Protect wildlife and marine heritage by avoiding disturbance**
- **Avoid birds, saltmarsh and reefs of Sabellaria (honeycomb tubeworm)**
- **Backfill holes**
- **Take litter home**
- **Check permissions of landowners and other consents that may be required**

Monitoring of Voluntary Codes

Monitoring of compliance with voluntary codes of conduct relating to bait digging is only undertaken on the Exe Estuary. Monitoring of some activities taking place on the Exe Estuary is undertaken by Habitat Mitigation officers of the South East Devon Habitats Regulation Partnership. This mainly involved monitoring of disturbance to birds which are protected under the SPA designation. The Mitigation officers are working with Footprint Ecology Consultants who are undertaking a three-year study to monitor activities on the Exe Estuary and whether they cause disturbance to birds, in particular, in the voluntary refuge areas. The first year of results are due to be delivered in June 2019 and the outputs from the study may help to inform management of activities, including hand working, in the site. The Habitat Mitigation Officers, whilst having some powers to enforce local authority byelaws, spend much of their time educating and raising awareness of the site designations and activities that may cause harm.

4. Our Research and Assessment Work

D&S IFCA has undertaken several studies looking at the levels and intensity of bait digging activity at key locations throughout the District. The results of these surveys are available on our website and have been used to feed into the MPA assessments that D&S IFCA has undertaken and submitted to Natural England for formal advice.

The individual reports are embedded (hyperlinked) below:

- Blow lug *Arenicola marina* density in the Severn Estuary 2012-13
- Bait Digging in the Severn Estuary European Marine Site (March 2019)
- Bait Digging in the Exe Estuary European Marine Site (January 2019)
- Bait Digging & Hand Gathering in the Torbay Marine Conservation Zone (January 2019)
- Bait Digging in the Plymouth Sound & Estuaries European Marine Site And Tamar Estuary Sites Marine Conservation Zone (January 2019)

All of the reports above are posted in Section H of the D&S IFCA website resource library.

4.1 Habitats Regulations Assessments and Marine Conservation Zone Assessments

In total 18 MPA assessments have been undertaken to assess the likely significant effect of bait digging on the designated features and site integrity of eight of the MPAs in D&S IFCA's District, where bait digging is known to occur. Table 2 summarises the conclusions of the assessments and the formal advice received from Natural England (NE). Bait digging has been found to have a range of impacts on both the sediment it occurs on, and the macrofaunal communities within it. Bird disturbance by bait digging activity is also a concern in areas designated for their bird populations. D&S IFCA's Environment Officers undertook a literature review on the impacts of bait digging and it is summarised below. The impacts are largely influenced by the level of activity, the sediment type and whether backfilling of holes or trenches takes placed.

4.2 Research

The following literature review has been undertaken**,** to gather information on the impacts of bait digging and has been used to inform the MPA assessments undertaken**.**

Impacts on sediment

Bait digging can occur to depths of up to 30-40cm, unearthing a deeper sediment that would usually remain undisturbed (Jackson and James, 1979). Changes can therefore occur in sediment characteristics as a result of bait digging. Undug sediment is found to have a higher organic content which is not driven by location. In unexploited sediments, a 10cm layer of well-mixed sand is created by bioturbation (primarily by lugworms), overlying a layer of sands and shell (Anderson and Meyer, 1986). The turning over of sediment by bait diggers and erosion of sediment mounds by tides and wave action leads to a loss of finer fractions and associated organic material. In addition, the depressions from holes dug may accumulate suspended sediment and organic matter resulting in an organically rich anoxic layer at the bottom of the depression (Fowler, 1999, Watson et al., 2017). The exposure and subsequent oxidisation of deep sediments by digging enables heavy metals, such as cadmium and lead, which are bound to sediment particles in reduced (anoxic) conditions, to become bioavailable (Howell, 1985).

If the depressions/ holes are subsequently filled with the overturned sediment through the process of back or in-filling, then the effect of the disturbance is reduced, and recovery can occur within three weeks (Fowler, 1999). Recovery rates are therefore influenced by the energy of the site, and behaviour of the bait diggers. Coarse sand beaches with considerable wave action will recover more quickly than sheltered sites. Experimentally dug plots in a very sheltered location in the Menai Strait were still visible after a year, although this is thought to be due to the presence of boulder clay (Johnson, 1984). Other, less sheltered, sites have reported a timeframe of 25 days for holes to disappear (Johnson, 1984).

Impacts on target species

Both blow lugworm (*Arenicola marina*) and king ragworm (*Alitta virens*) are targeted by bait diggers throughout the D&S IFCA's District. Relative to other exploited intertidal invertebrates, blow lugworms are thought to be very resilient to exploitation and disturbance because of their relative fecundity, widespread distribution and harvesting of adults does not affect the supply of juveniles from nursery beds elsewhere on the shore (Fowler, 1999). Bait diggers have been reported in the literature to remove 50-70% of *A.marina* present in each area where digging occurs (Heilgenberg 1987, Blake, 1979) but D&S IFCA's observations suggest this may be much lower in some areas, especially where large areas of lugworm exist, and holes are relatively well spread out.

A variety of responses by *A.marina* to exploitation have been reported in the literature. Olive (1993) describes the scenario which led to complete removal of all lugworms from a large area of a National Nature Reserve in Northumberland in 1984, with densities falling from >40m^{-2} to <1m^{-2} within a six-week period. When the site was closed to bait digging it repopulated within a matter of months, thanks to the presence of extensive non-exploited populations nearby. Similarly, lugworm populations in the Dutch Wadden Sea appear to be unaffected by large scale commercial exploitation, with an estimated 2 x 10^7 individuals taken annually. Blake (1979) reported that complete recolonisation occurred within one month after areas were experimentally dug out in Whitely Bay. In contrast, Cryer et al. (1987) found no recovery in worm densities after 6 months following experimental removal, although natural densities at the test site in South Wales were low (9-16 worms/m^{-2}) and the survey ran through the less productive winter months. Similarly, Harvard and Tindal (1991) found dug areas to recolonise over a period of several months. After 6 months lugworm in experimentally dug plots had only

recovered to 21% of control site numbers. The capacity of a population to withstand bait digging activities therefore relies on several factors including the size of the exploited area relative to the total lugworm bed, the presence of other lugworm beds nearby, the presence of nursery areas, the relative exploitation of adult and juvenile lugworm, and the intensity and seasonality of bait digging (Olive, 1993). However, overall, they are thought to be resilient to bait digging.

King ragworm*, Alitta virens,* is a keystone intertidal species as prey for fish, birds and crustaceans, is a predator of other invertebrates and has an important role in bioturbation of the sediment (Watson et al. 2017). *A.virens* are generally found in more sheltered sediment areas but they can also be found in more mixed sediments (E West, Pers. Obs.). It is suggested in the literature that individuals reach sexual maturity at 2 years, spawn and then die (Farrell, 1999). This life cycle provides a high population turnover enabling them to recover quickly (within one month) from bait digging, provided not all adults are taken from the area dug (Olive, 1993). On the Gann, populations of *A.virens* are able to sustain prolonged and intense extraction throughout the year (Evans et al., 2015). However, some individuals can experience delayed maturation, such as the boulder clay population in the Menai Strait resulting in susceptibility to over digging (Olive 1993).

Additional populations of *A.virens* are usually present in adjacent subtidal areas that act as a source of juveniles. They are therefore considered to be resilient to bait digging activities (Fowler, 1999) and have been found to occur in higher densities where bait digging occurs (Watson et al., 2007). This may be as a result of a change in the macrofaunal community benefitting *A.virens*, due to its opportunistic nature (Evans *et al*., 2015). On the North East coast of England, a study found similar densities (~15m^2 during the summer, ~3m^2 during the winter) of *A. virens* in both exploited and unexploited populations (Blake, 1979). Recovery of a *A.virens* population will therefore depend on the age of maturity, the selectivity of the bait digger and the presence of refuge populations in adjacent areas.

Impacts on non-target species

Bait digging can have adverse effects on a wide variety of species as a result of physical damage, burial, smothering and/or exposure to desiccation or predation to non-target invertebrates. The impacts of bait digging on the macrofaunal community are well studied. Recovery of small short-lived invertebrates is usually quick, through migration into the dug areas (Fowler, 1999). For example, McLusky et al (1983) found a reduction of 80-100% for *Hydrobia ulvae* and almost 100% for *Macoma* after bait digging at a site in Scotland, however densities of these species recovered to indistinguishable from pre-disturbance within 3 weeks.

In contrast, populations of larger, long-lived invertebrates with infrequent recruitment may take much longer to become established due to their life history characteristics and fragile nature (Beukema, 1995). In some extreme cases local diversity may be reduced, which may be especially true in physically fragile environments such as eelgrass or mussel beds (Fowler, 1999). For example, Farrell (1999) reported the complete loss of the large sedentary worm *Amphitrite johnstoni* and *Harmathoe imbricate* from experimentally dug sites in Chichester harbour, with no real recovery seen a year after digging. Digging led to a sharp reduction in the total biomass of species recorded that was apparent only one month after digging. In Chichester harbour the complete loss of the large sedentary worm *Amphitrite johnstoni* and *Harmathoe imbricate* was observed from experimentally dug sites, with no real recovery seen a year after digging. Similarly, Beukema (1995) found that within a 1km^2 area of the Dutch

Wadden Sea, the local lugworm stock declined by more than double over a four-year mechanical digging period. As a result of this decline, total zoobenthic biomass also declined, with short lived species showing a marked reduction during the digging period. Recovery of the benthos took several years, especially by the slower establishing species. However, if disturbance by digging is short term, benthic communities can recover within six months (Beukema, 1995).

Jackson and James (1979) investigated the effects of bait digging on cockle populations. They found that increased digging in an area caused higher cockle mortality, particularly on smaller individuals. The cause of mortality was due to burial/smothering as individuals that are buried cannot regain their normal position at the surface of the sediment and at a depth of 10cm individuals rarely survived. Shackley *et al*., (1995) also demonstrated these effects in the Burry Inlet, South Wales. Wynberg & Branch (1997) assessed the impacts of trampling associated with the use of suction pumps for the collection of prawns as bait, by comparing areas that had been sucked over with a prawn pump, to areas that had been trampled only. Prawn densities were depressed six weeks following both sucking and trampling but recovered by 32 weeks. Macrofaunal numbers declined in most treatment areas and macrofaunal community composition in the most-disturbed areas was distinct from that in other areas. They determined that the trampling itself has almost the same effect as sucking for prawns, on both the prawns and on the associated biota.

It is important to note that the effects on macrofaunal communities can differ substantially between estuaries. For example, the mud content of an estuary can affect the resilience of the communities to bait digging. Although Dernie et al. (2003) found that it was not possible to predict the recovery rates of assemblages based on percentage of silt and clay in the sediment, there was a good relationship between recovery rate and infilling rate, which is linked to the physical characteristics of the sediment. Clean sand habitats were the quickest to recover both in terms of physical and biological characteristics. Other studies have also found extended recovery times for estuaries with high mud content (Carvalho et al., 2013). The site-specific nature of the impacts of bait digging was also demonstrated by Watson et al. (2017). They found that responses were both site and disturbance type specific. Their data also showed that responses were not consistent between species (e.g. *C. volutator* and *P. ulvae*) or even between those within the same trophic group. They, therefore, concluded that bait collection alters the macrofaunal community and the associated sediment characteristics across large spatial scales, but with the caveat that the strength (and type) of the response is site specific.

Moshabi et al. (2015) also explored the impacts of bait digging on the macrofauna of intertidal mudflats. The fauna of their study area (the tidal mudflats of Kneiss Islands, Tunisia) was mainly composed of polychaetes, the more abundant families being the *Nereididae*, *Arenicolidae* (fishing target species) and the *Cirratulidae*. They found the number of taxa and abundance of individuals were affected by bait digging; the abundances estimated at the control stations were significantly higher than those estimated at the three stations before and after bait collection, with some polychaete species disappearing after one month of bait digging. This indicates that the intertidal macrozoobenthic biodiversity at the impacted stations is affected by the bait digging activity, or possibly by trampling. Trampling has been shown to negatively modify the abundance of some species (*Macoma balthica* and *Cerastoderma edule*) through direct mortality or burial (Rossi *et al*., 2007). However, the effects of trampling from bait diggers would be negligible compared to the footprint of public activity at potential

bait digging sites. In addition, recovery can be fast for small invertebrates particularly during the growing season due to a continuous supply of larvae and juveniles.

Seagrass beds and saltmarsh habitat can also be damaged by bait digging as it loosens and uproots plants and may result in beds being washed away. d'Avack et al. (2014) describe how seagrasses are not physically robust. The leaves and stems of seagrass plants rise above the surface and the roots are shallowly buried so that they are vulnerable to surface abrasion. The removal of above-ground biomass would result in a loss of productivity whilst the removal of roots would cause the death of the plant. Heavy abrasion accompanied by crushing or compaction of sediments would lead to more severe effects. They classed seagrass as "high" sensitivity to penetration/disturbance of the substrate (no resistance, low resilience). Abrasion to the sub-surface will directly impact seagrass habitats as the plant is confined to the upper layer of the sediment. The shallow root systems are thus likely to be removed leading to the death of the plant. Finally, d'Avack et al. (2014) classed seagrass as "high" sensitivity to physical change to another seabed type (low resistance, and very low resilience). Seagrass beds occur almost exclusively in shallow and sheltered coastal waters anchored in sandy and muddy bottoms. A physical change to another seabed type will therefore have a detrimental effect on seagrass beds as they will be excluded from the newly created habitat. A change towards a coarser sediment type would inhibit seagrasses from becoming established due to a lack of adequate anchoring substratum. A more mud dominated habitat on the other hand could increase sediment re-suspension and exclude seagrasses due to unfavourable light conditions. Garmendia et al. (2017) found that shoot density of seagrass decreased with trampling as part of shellfishing activity. They concluded that shellfishing adversely effects seagrass abundance.

Digging for ragworm can also occur within mussel beds on sediment areas. The physical disturbance can cause the mats of mussels to break up and be washed away, resulting in loss of habitat for a wide variety of species (Fowler, 1999).

Impact on Birds

Bird disturbance is also a major concern, especially where peak bait digging coincides with peak bird abundance or intertidal activity (Townshend and O'Connor, 1993). Bait collection has been found to induce a 'temporary loss of habitat' for some bird species, with bait collector numbers negatively correlating with wader and gull abundance (Watson et al., 2017). Wildfowl, such as mute swans may be the least likely group to be vulnerable to disturbance, as many of these species are fed directly by humans (Liley and Fearnley 2012, Watson et al. 2017).

Lugworm is an important prey item for the Grey Plover and the Bar-Tailed Godwits in the Severn (Goss-Custard et al., 1991). There is an important link between macrofaunal biomass (energy content) and the behaviour of wading birds. Wading birds have been shown to extend their feeding period, increase their attack rate, broaden their prey or move to different areas in order to cope with reductions in infaunal biomass (Zwarts, 1993).

Although the process of bait digging can directly target prey items for certain bird species, it can also indirectly impact the forging efficiency of wading birds through increased mortality of associated invertebrate fauna. For example, Shepherd and Boates (1999) found that foraging efficiency of sandpipers was significantly lower in areas targeted for bait digging of bloodworms. Foraging efficiency decreased by 68.5%. This species of bait is not a prey item for the sandpiper but the process of bait digging resulted in a 38% decrease in density of their

amphipod prey, *Corophium volutator,* after one year of baitworm harvesting in the Bay of Fundy. This decrease was as a result of direct mortality and lower juvenile recruitment. It was also observed that sandpipers on dug regions took longer to build up fat deposits needed for migration.

As well as impacting habitats and prey species used by birds, the birds themselves can be impacted by bait digging activities by way of disturbance. Goss-Custard and Verboven (1993) found that the presence of people in areas used for feeding and breeding can alter the behaviour and distribution of estuarine birds. Meaning the birds may become displaced into areas with a lower prey density. A disturbance review by the Exe Estuary Management Partnership (2016) summarised that disturbance levels can be dictated by a number of factors such as noise level, amount of activity and number of people present. However, disturbance by bait collection generally occurs via visual (seeing the collector and responding as if they were a potential predator) and/or noise disturbance (causing distress via deviation from the "natural" ambient noise). Liley et al. (2011) found that whilst bait-digging and crab-tiling accounted for 7% of bird disturbance events in their study on the Exe Estuary, this was just a count of number of events, and bait-digging actually accounted for 16% of all major flight events.

Liley et al. (2012) carried out observational surveys in Poole Harbour, recording activities which resulted in bird disturbance. For 93% of observations there was no response from birds, only 1% resulted in major flights. 1558 potential disturbance events were recorded over 63 hours of survey. During the 63 hours of surveillance there were just five individual disturbance events involving bait collection, none resulted in the birds being flushed. Townshend and O'Connor (1993) found that disturbance caused by bait digging activity greatly reduced the extent of use of the Lindisfarne National Nature Reserve (NNR) by wigeon, bar-tailed godwit and redshank. However, significant increases in the populations of wildfowl were recorded in the year following a ban on bait digging.

Urfi et al. (1996) looked at how oystercatchers compensate for lost feeding time following disturbance. They expected to find that feeding rates would increase, however, instead they found that feeding time was extended. They also found that birds are able to habituate to the frequent presence of people within feeding areas, reducing the distance at which they take flight, therefore reducing the amount of feeding time lost. Goss-Custard and Verboven (1993) also found that oystercatchers subjected to minimal disturbance conditions have been known to habituate to the presence of people, depending on the movement of the individuals. However, De Boer and Langamane (1996) found that larger birds have longer Minimal Approach Distances (MADs) when influenced by human presence and their foraging activity decreases earlier when approached.

Hockin et al. (1992), shows disturbance can have an effect on breeding success through several factors e.g. nest abandonment, increased mortality of eggs due to predation & increased mortality of young through reduced feeding. Disturbance can reduce use of sites by birds, and can affect nest site choice, having a negative effect on population density. It can also have a negative effect on energy budgets – time spent flying, reduces time spent feeding.

4.3 D&S IFCA Survey Work

D&S IFCA Officers have undertaken survey work to gather information and data on the bait digging effort in MPAs in the District.

Exe Estuary SPA

Bait digging effort levels were monitored both within the estuary over three separate survey periods between 2012 and 2018. The majority of the effort seemed to be focussed on the eastern shore, around the Imperial Recreation Ground at Exmouth. Ragworm was the primary target species at Starcross to Cockwood, on the western shore of the Exe, while lugworm was the main target species at Recreation Ground on the eastern shore. This is likely due to the difference in sediment on the two shores. Ragworms are known to prefer more gravelly/mixed sediment, such as that found on the west bank of the Exe, while lugworms are known to prefer more sandy/muddy sediment, as is found on the east shore.

Effort, in terms of mean number of bait diggers seen per hour, at Recreation Ground appeared to be relatively even in 2012-2013 and 2018, but much higher in 2014-2015. This could partly be explained by the sampling effort: in 2012-2013 five surveys were carried out at Recreation Ground; in 2014-2015 16 of the surveys were at Recreation Ground; and in 2018 the Recreation Ground was sampled on all 14 surveys. The similar survey effort between 2014-2015 and 2018 implies that digging effort was higher in 2014-2015 than 2018. However, effort in terms of number of holes seen per survey was highest in 2018. This implies that although there were fewer bait diggers working in 2018 than 2014-2015, they were digging a larger number of holes. Although no surveyors recorded any bait digging taking place directly on the visible seagrass beds, the mapped data appears to show some overlap between this activity and habitat. There are currently voluntary measures in places to prohibit bait digging on seagrass, however the mapped bait digging records appear to show some overlap with the seagrass beds. This interaction has been explored further through a Habitat Regulations Assessment (HRA) to determine if the bait digging activity could be having an adverse effect on the intertidal seagrass supporting habitat of the SPA.

Plymouth Sound and Estuaries EMS and Tamar MCZ

Bait digging effort levels were monitored both within the EMS and MCZ, and on the Plym, just outside the designated areas. The highest levels of bait digging found were in the Plym, just outside the Plymouth Sound & Estuaries EMS , which is believed to be commercial, but bait digging was identified in the Tamar at Ernesettle. The highest levels of bait digging occur over the spring months then decrease throughout the year, with little activity seen over the winter months when the over-wintering bird populations, for which the SPA is designated, would be present. The decline in observed digging effort between spring and summer could be explained by the decline in survey effort over the summer months. Survey effort was fairly even across spring, autumn and winter, indicating the decline in observed activity throughout autumn and winter is a true reflection of the seasonality of bait digging effort. Extra surveys were carried out at Ernesettle in the summer and autumn of 2017, which may explain why the observed activity levels at this site are more even across the seasons than at Embankment, which was only surveyed in 2014-2015. The results from this work together with a survey of recreational use of the Plymouth Sound and Estuaries EMS under taken by Langmead *et al*., (2017) and published by Tamar Estuaries Consultative Forum have fed into the MPA assessments for the sites.

Torbay MCZ

Bait digging effort levels were monitored within the MCZ in 2016 and 2017. The majority of the effort seemed to be focussed during the 2017 period and at Goodrington and Broadsands. The main species targeted across all sites is lugworm, with some ragworms being targeted at Goodrington. The muddy/sandy sediment characteristics across the sites, is the preferred habitat for lugworms.

Although survey effort and maximum number of bait diggers seen increased from 2016 to 2017, effort (mean number of bait diggers seen per hour) has decreased. The number of holes observed was also higher in 2017, however, data were not available on the number of holes observed during the 2016 survey. The increase in the number of holes dug may result in a decline of local abundance of lugworms. However, the capacity of a population to withstand bait digging activities relies on several factors including the size of the exploited area relative to the total lugworm bed, the relative exploitation of adult and juvenile lugworms, and the intensity and seasonality of bait digging. Effort within the MCZ is relatively low with a maximum of just over one bait digger per hour being observed at one site. In addition, lugworms have been shown to be relatively resilient to bait digging due to its fecundity and widespread distribution (Fowler, 1999). There is currently no voluntary code of conduct for the MCZ. The results of the survey work fed into the MCZ assessment for the interaction of this activity on features of the site.

Severn Estuary EMS

Surveys of bait digging in the Severn Estuary took place for two years during the period 2012-2013 and 2014-2015. These surveys inform the first semi-quantitative assessment of this activity in the area. The majority of digging effort is for lugworms on the sandy beaches at Burnham on Sea, Berrow, Brean, Weston-Super-Mare and Sand Bay with more localised targeting of ragworms in some locations. Bait digging effort in the Severn Estuary is greatest in Autumn and Winter, thought to be due to the popularity of sea angling for whiting and cod at this time of year.

Bait digging effort showed mean values of between 0.2-0.8 bait diggers per hour. Median values for the number of holes observed per survey were close to zero with a maximum of 185. The maximum number of bait diggers observed ranged between 2 and 4 diggers per survey depending on the site and year. There was some inter-annual variation in angling effort, possibly relating to the strength of the cod run with effort higher in 2014-2015 than the earlier sampling period. Bait digging was spatially limited at some sites depending on access points, and the areas dug tend to be very small in relation to the size of the intertidal mudflats. Digging primarily occurred around low tide although it was generally middle to upper shore areas which were dug due to the distance to walk out to low tide, the prevalence of muddy habitat in many areas and the danger involved in walking out on the mudflats. Some commercial activity has occurred in the past and D&S IFCA officers did observe two individuals who were thought to be digging commercially. These diggers dug considerably more often and for more lugworm compared to recreational diggers. Backfilling of holes did not take place, with most anglers citing the powerful tidal currents quickly naturally backfilling as the reason for not doing so themselves. There were no clear trends in bait diggers perceptions of the trends in lugworm populations, and most did not believe any form of management was necessary. The findings of this report will be used to inform Habitat Regulations Assessments for the Severn Estuary Special Area of Conservation and Special Protected Area.

Table 1: Bait Digging – Summary of MPA Assessments Undertaken

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
Braunton Burrows SAC	Intertidal mudflats & sandflats	25/09/2018	Because the level of bait digging was low, the conclusion was that there would not be a significant effect on the features.	12/10/2018	Agreed that bait digging is not likely to have a significant effect on features and adverse effect on the integrity of the EMS.	HRA NE Formal Advice
Exe Estuary SPA	Supporting habitats for the bird features: Intertidal Seagrass.	22/03/2019	No adverse effect on bird features and their supporting habitats. However concern was raised about the possibility of digging happening directly on the seagrass habitat, despite the Exe Estuary voluntary code being in place.	02/04/2019	Agreed with conclusion of assessment of no significant effect. NE supports the IFCA's intention to create a permitting byelaw for Hand Working to allow for future monitoring of activities and create a mechanism to bring in mitigation measures in the future if required. Despite the voluntary code being in place NE was concerned that bait digging actively overlaps with the intertidal seagrass feature and therefore a permitting byelaw might be necessary.	HRA NE Formal Advice
Exe Estuary SPA	Supporting habitats for the bird features: Intertidal coarse sediment; intertidal mixed	02/04/2019	No adverse effect on bird features and their supporting habitats. Concern was raised about the impact of not back filing holes. However any	Awaiting Response	Awaiting Response	HRA

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
	sediments; intertidal mud; intertidal sand and muddy sand.		possible impact on sediment characteristics can be mitigated if holes are back filled.			
Exe Estuary SPA	Supporting habitats for the bird features: Saltmarsh; grazing marsh; intertidal stony reef; intertidal stony rock; intertidal biogenic reef; Circalittoral rock; Infralittoral rock; Subtidal biogenic reef; Subtidal coarse sediment; Subtidal mixed sediment; Subtidal sand; Subtidal seagrass; Subtidal stony reef.	02/04/2019	No adverse effect as bait digging is not interacting directly with the supporting habitats. Access point to the preferred bait digging habitats are not near the supporting habitats and therefore bird disturbance will be minimal.	Awaiting Response	Awaiting Response	HRA
Plymouth Sound and Estuaries SAC	Intertidal mud; intertidal; sand and muddy sand; intertidal mixed	03/04/2019	Bait digging occurs at low level on the Tamar. Concern was raised about the impact of bait digging in	11/04/2019	Agreed that the activities are not likely to have a significant effect on features and adverse effect on the integrity of the EMS. NE	HRA NE Formal Advice

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
	sediment; intertidal coarse sediment		particular that the lack of back filing of holes. However any possible impact on sediment characteristics can be mitigated if holes are back filled.		supports the IFCA's intention to create a permitting byelaw for Hand Working to allow for future monitoring of activities and create a mechanism to bring in mitigation measures in the future if required. NE suggested that a permitting byelaw might be necessary to introduce management measures to include back filing holes/trenches.	
Plymouth Sound and Estuaries SAC	Saltmarsh; salt meadows; intertidal seagrass; intertidal rock	03/04/2019	No adverse effect as bait digging is not interacting directly with these features, although it has the potential to impact the saltmarsh features assessed from access to bait digging sites causing trampling. However, the level of trampling is not thought to be significant to affect the extent, distribution, species composition and communities.	11/04/2019	Agreed that bait digging is not likely to have a significant effect on features and adverse effect on the integrity of the EMS.	HRA NE Formal Advice
Tamar Estuaries Complex SPA	Avocet, Little Egret; Supporting habitats: intertidal mud, intertidal mixed sediment;	03/04/2019	Bait digging occurs at low level on the Tamar. Concern was raised about the impact of bait digging in particular that the lack of back filing of holes.	11/04/2019	Agreed that the activities are not likely to have a significant effect on features and adverse effect on the integrity of the EMS. NE supports the IFCA's intention to create a permitting byelaw for	HRA NE Formal Advice

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
	intertidal sand & muddy sand.		However any possible impact on sediment characteristics can be mitigated if holes are back filled.		Hand Working to allow for future monitoring of activities and create a mechanism to bring in mitigation measures in the future if required. NE suggested that a permitting byelaw might be necessary to introduce management measures to include back filing holes/trenches and ensure there is no disturbance to the SPA birds.	
Tamar Estuaries Complex SPA	Avocets, Little Egret. Supporting Habitats: Saltmarsh; annual vegetation of driftlines; coastal reedbeds; freshwater & coastal grazing marsh; intertidal seagrass.	03/04/2019	No adverse effect as bait digging is not interacting directly with the supporting habitats. Access points to bait digging sites are not near saltmarsh or intertidal seagrass beds. Therefore level of bird disturbance is not thought to affect population size or distribution. Additionally, trampling is not thought to be significant to affect the extent, distribution, species composition and communities of the supporting habitats	11/04/2019	Agreed that bait digging is not likely to have a significant effect on features and adverse effect on the integrity of the EMS.	HRA NE Formal Advice
Severn Estuary SAC	Estuaries; Estuarine Bird Community	03/04/2019	The assessment concluded that he current level of bait digging has no adverse	Awaiting response	Awaiting response	HRA

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
			effect on the integrity of the Severn Estuary SAC or SPA interest features. Concern was raised that if the level of activity increased this might have an adverse effect on the conservation objectives and site integrity.			
Severn Estuary SAC	Estuaries; Mudflats and Sandflats. Sub – features: Intertidal coarse sediment ;intertidal mixed sediments; intertidal mud; intertidal sand and muddy sand.	03/04/2019	The assessment concluded that he current level of bait digging has no adverse effect on the integrity of the Severn Estuary SAC or SPA interest features. Concern was raised that if the level of activity increased this might have an adverse effect on the conservation objectives and site integrity.	Awaiting response	Awaiting response	HRA
Severn Estuary SAC	Estuaries; reefs. Circalittoral rock Infralittoral rock Intertidal rock Intertidal biogenic reef: Sabellaria spp.	03/04/2019	No direct impact on the designated features will occur and the level of trampling is not thought to be significant to affect the extent, distribution, species composition and communities. Therefore	Awaiting response	Awaiting response	HRA

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
	Subtidal biogenic reef: Sabellaria spp.		there is no likelihood of significant adverse effect on the interest features			
Severn Estuary SAC	Atlantic salt meadows	03/04/2019	Bait digging does not occur on this habitat and trampling is not thought to occur and therefore there is no likelihood of significant adverse effect on the interest features	Awaiting response	Awaiting response	HRA
Severn Estuary SPA	Bewicks Swan; European White-Fronted Goose; Dunlin; Redshank; Shelduck; Gadwall Internationally Important Assemblage of Waterfowl	05/04/2019	The current level of bait digging has no adverse effect on the integrity of the Severn Estuary SAC or SPA interest features. However if commercial bait digging were to commence in the SPA this could result in an adverse effect on the conservation objectives and site integrity of the site.	Awaiting response	Awaiting response	HRA
Severn Estuary SPA	Intertidal mud; Intertidal sand and muddy sand; Intertidal mixed sediments	05/04/2019	The current level of bait digging has no adverse effect on the integrity of the Severn Estuary SAC or SPA interest features. However if commercial bait digging were to commence in the SPA this could result in an adverse effect on the	Awaiting response	Awaiting response	HRA

Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
			conservation objectives and site integrity of the site. Concern was raised about the lack of back filling of holes which could impact the sediment characteristics.			
Severn Estuary SPA	Intertidal rock	10/04/2019	Bait digging does not take place on this habitat and therefore there is no likely significant effect on the interest feature. Trampling is not thought to be at a level that could impact the feature.	Awaiting response	Awaiting response	HRA
Severn Estuary SPA	Coastal reedbeds; Freshwater and coastal grazing marsh; Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	10/04/2019	Bait digging does not take place on this habitat and therefore there is no likely significant effect on the interest feature. Trampling relating to bait digging is not thought to occur across these habitats.	Awaiting response	Awaiting response	HRA
Tamar MCZ	Intertidal biogenic reefs; Intertidal coarse sediment Blue mussel (*Mytilus edulis*) beds; Native	18/04/2019	There is not believed to be any overlap between the activity and the features assessed. Therefore, it is believed that there is no	Awaiting response	Awaiting response	MCZ Assessment

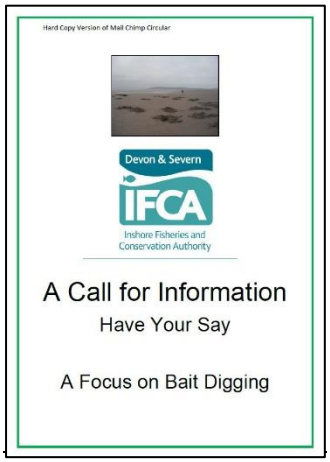
Site	Habitat / Feature and bait digging Interaction Assessed	Date sent to NE	Conclusion of Assessment	Date of Formal Advice from NE	Summary of NE Formal Advice	Links
	oyster (*Ostrea edulis)*		significant adverse effect on the interest features.			
Torbay MCZ	Intertidal coarse sediments; Intertidal mixed sediments; Intertidal mud; Intertidal mud and muddy sand; Low energy intertidal rock; Moderate energy intertidal rock; Intertidal underboulder communities; Peat and clay exposures; Native oyster (*Ostrea edulis*); Seagrass beds Long-snouted seahorse (*Hippocampus guttulatus*)	15/04/2019 2019	The assessment concludes there is no likelihood of significant adverse effect on the interest features. However there were two areas of concern highlighted: The lack of back filling of holes made by bait diggers could impact sediment characteristics, and if the level of effort were to increase this may cause a concern and trigger a reassessment.	Awaiting response	Awaiting response	MCZ Assessment

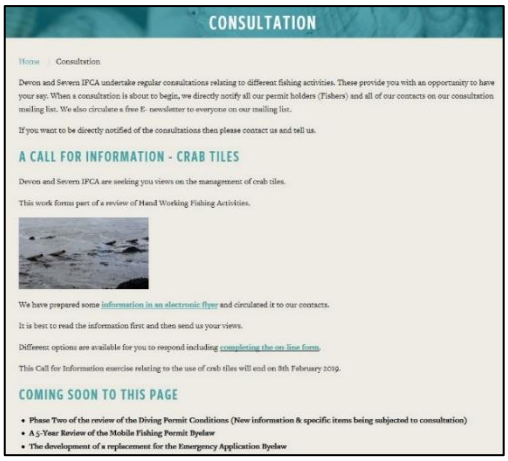
5. Engagement with Stakeholders

Officers selected elements of the D&S IFCA communications strategy to engage with stakeholders between 29th March and 26th April 2019. The Call for Information campaign had the intention of highlighting the review of management (phase 2 – Bait Digging) and getting stakeholders and interested parties to engage in the process.

Electronic engagement formed the basis for communication. An electronic (Mail chimp) email was directly circulated to over 1000 D&S IFCA email contacts (including members) with a request for it to be forwarded to others that may also have an interest in the subject matter. The information provided an overview of the method, how it is currently managed and an overview of the type of information being requested. Hard copies of information were not circulated and were not requested by any stakeholders.

- **Mail Chimp (PDF) Have Your Say Campaign**





The D&S IFCA website was utilised to support the campaign and the consultation page was used to display the information. In addition, officers created a news item blog for the home page news scroll highlighting the Call for Information campaign. The blog was also posted on the D&S IFCA Facebook page.

Stakeholders had the opportunity to use all options provided to have their say. An on-line questionnaire was developed by officers using Google Forms and was embedded in the email information along with a dedicated email response address. Four dedicated “surgery sessions” were arranged for one to one interaction with officers via visits to the D&S IFCA offices in Brixham or the answering of telephone calls specific to bait digging.

To meet GDPR requirements, the D&S IFCA Privacy Policy was highlighted along with options to un-subscribe from future Hand working mail shots.

The On-Line Survey Form

The on-line form was an attempt to blend open and closed questioning. It has been transcribed below:

29th March to 26th April 2019

Questions about you

Email Address

Full Name

How did you hear about this questionnaire?

- Direct notification in the email circular
- D&S IFCA Website
- D&S IFCA Facebook
- Twitter
- From another source (such as an email forwarded from someone else)

Questions about the activity of bait digging

Explain what interest you have in the activity of bait digging?

If you dig for bait:

- Where do you dig – which estuary or coastal area?
- How often do you go bait digging?
- What level of catch does your bait digging generate?
- Is your bait digging for commercial or recreational use?

You may know or watch others bait digging? If so:

- Where do you see others bait digging?
- How many people do you see bait digging in those locations?
- How often do you see bait digging being conducted in those locations?
- Does the bait digging activity conducted by others cause you concern?

Do you have any other concerns about this fishing activity and if so what are they?

Managing the activity of bait digging

Which voluntary codes do you have knowledge of?

In your view, how effective are voluntary codes for managing bait digging?

What could be done to improve voluntary codes?

Do you think that management of bait digging is needed in other areas of the D&S IFCA District? – Where and why?

Would you favour the introduction of a D&S IFCA byelaw to manage bait digging?

Why would you prefer a D&S IFCA byelaw, rather than the use of a voluntary code/s?

What is your view on the use of D&S IFCA permits to manage bait digging?

Should D&S IFCA permits be introduced for a specific area or all areas where bait digging takes place?

What D&S IFCA permit restrictions would you like to see introduced and why?

What effect would your suggestions have?

What impact do you think your suggestions would have on others?

Do you have more to say?

Do you have any other comments or information?

6. Summary of Response - A Call for Information – Crab Tiles

A total of 32 responses were received. Over 60% of stakeholders that completed the on-line form stated that they were made aware of the campaign via direct notification.

Format	Total Number of Responses
Email	3
On-line surveys	29
Surgery Sessions with Officers/Other	0

Overview

Two summary response tables (numbers 2 and 3) have been created that include the key information that was possible to extract from the responses. All responses have been summarised, including those that are of little or no use for discussions.

Following the summary tables, a small text summary of response has been compiled. Officer comments have also been added to provide some additional information that may be of use to aid the discussions of members.

The responses fall into two categories and were a fairly even split between those that conduct the activity (on a recreational basis) and those with another interest such as anglers or organisations with an interest in the subject matter. No commercial bait diggers responded.

Many different areas where digging is being conducted within the District were highlighted within the responses. Very little information was gained regarding the amounts taken by those conducting digging, and it appeared that the question relating to this was misunderstood by many of those that responded. Continued use of or additional use of voluntary codes was a popular option for management, especially by those that conduct the activity on a recreational basis.The majority of stakeholders were not in favour of regulation (a new byelaw) or the use of permits; however, concern was raised associated with commercial digging, either currently being conducted or the possibility that it may be conducted in different areas and increase over time.

Generally, there was little concern about the levels of bait that are available to take, however one stakeholder reported that worm beds in Portishead and Clevedon have been all but wiped out and rag worm can't return due to disturbance in substrate.

Response Summary Tables

Table 2: Responses from Recreational Bait Diggers

Ref No	Focus Estuary/Area of Interest	Frequency of own Digging/ amount taken	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
01	Digs: Dart, Avon, Torbay	10 to 12 times per year	Knowledge of Exe Code. Little can be done to improve it	Yes: Byelaws can be enforced, codes can't.	No, excessive bureaucracy	Prohibit commercial bait digging. Prevent intensive digging. Limit number of worms to be taken to 50 per tide.
05 e mail	Digs: Torbay (Torre Abbey, Paignton, Goodrington & Broadsands	Occasional digging	None	No: Not for beach digging	Unknown	Worms taken from beaches are not favoured by most anglers. Estuary worms are slightly tougher. IFCA should use its resources for wrasse studies and protecting low stocks of mullet and wrasse.
06	Digs: Exe	Occasional digging/ takes as many lugworm as is needed	No knowledge of any voluntary codes.	No: There are greater priorities.	No	Suggests more codes of conduct and publicity of them.
08	Digs: Exe	Digs 25 times per year. A good catch.	No knowledge of any voluntary codes	No	No	Digging is not a problem. Many people are too lazy to big their own bait. Has been digging for 30 years +. There are fewer diggers than there used to be. There are more worms than there used to be.
11	Digs: Severn/Sandbay (Weston Super-Mare)	Digs every 2 weeks. Minimal take	No knowledge of any voluntary codes	No	No	Management is not needed. Been digging for 50 years and there are as many lug worm now as back then.
13	Digs: Severn (Portishead) / Observation: Clevedon & Weston Super-Mare.	Goes digging 4 times per year on spring tides.	No knowledge of any voluntary codes	Yes: Management may save the king ragworm	Unknown	Concerns that worm beds in Portishead and Clevedon have been all but wiped out. Rag worm can't return due to disturbance in substrate. Worms have reduced in size. The whole activity should be prohibited.

Ref No	Focus Estuary/Area	Frequency of own Digging/ amount taken	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
14	Digs: Exe. Observation: Exe	Digs once or twice per week.	Knowledge of Exe Code. Code works well but a few don't back fill holes. Increase publicity of this code.	Not convinced it is needed on Exe. A byelaw may be of use to protect the "Duck Pond" area if activity increases.	Possibly: Depends if there is a cost and what restrictions would be imposed	Concerns about potential over digging. Restrictions favoured to avoid over digging different sites and limit the number of worms that can be taken. Concerns that commercial digging may impact on recreational opportunities to dig. Observes activity taking place most days when tides and weather are favourable.
15	Digs: Severn (Sand Bay and Weston-Super-Mare beaches) Observation: Same areas	Digs every 2 to 3 months.	Knowledge of Severn code. Code works well but more publicity in tackle shops suggested.	Unsure but not in favour of a byelaw or restrictions for recreational digging.		Favours use of Byelaw for commercial digging but not recreational digging. Don't punish recreational diggers who only usually take what they need.
16	Digs: Southwest Peninsula	Digs 12 times.	Has knowledge of a few codes. Work well enough.	No	No	Byelaw & Permits an unnecessary burden for a low-key exercise. Excessive burden for individuals and an administration burden to IFCA. Not enforceable. Should focus on educational material via numerous sea angling clubs and industry media. Observes more bait diggers when a fishing completion is scheduled. Suggests a generic code for all areas.
17	Digs: Hope Cove Observation: Hope Cove, Bantham and Plym	Digs 2 times per year	No knowledge of voluntary codes.	No	No	Further management/Byelaw not a good use of IFCA time & resource. There are no benefits from existing D&S IFCA permits for other methods.
19	Digs: Salcombe Observation: Salcombe (North Sands, Ditch End & Tosnoss Point	Digs occasionally	No knowledge of voluntary codes.	Yes, depending on the restrictions	Ok if it can be well publicised in the popular areas.	Officers would need to show a presence at low water periods to check or there is no value in legislation. Would not like to see commercial bait digging begin in the Salcombe area as presently there is none.

Ref No	Focus Estuary/Area	Frequency of own Digging/ amount taken	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
22	Digs: Plymouth Observation: Plymouth	Digs 5 to 10 times per year.	No comment	Only if there is no restriction on this hobby	Not specified	Suggests more information and awareness about voluntary codes in angling press
25	Digs: Taw Torridge Observation: Taw Torridge	Digs 2 to 3 times per month	Knowledge of Estuary Users Guide. Suggests more signs	No	No	More management is not required. Educational material on back filling seems to work. There is limited commercial diggers in this area servicing the local tackle shops.
26	Digs: Exe	Digs once per week to once per month.	Has knowledge of them and very supportive of them. Feels they work very well for all.	Not in favour	Not generally in favour but maybe permits for commercial diggers.	Has the view that everyone should be able to dig enough for their own use. Feels current restrictions/code in the Exe works very well and the liaison between users and estuary forum groups is very beneficial. States that very little disturbance is caused by the activity. Possibly try and promote the codes more. Consider use of a generic code for all areas. Commercial digging is important to supply market for anglers to use as bait.
27	Digs: Taw Torridge	Digs twice per year	Knowledge of several codes	No	Not specified	Doesn't consider bait digging as a problem. Feels codes work well and more promotion (social media and visits to angling clubs) of them is beneficial.
29	Digs: Plymouth (Millbrook & Embankment)	Digs in winter time once per week	No comments	Yes	Yes, but feels it would be difficult to enforce.	Observes relatively high activity of others – Up to 6 people digging on spring tides 4 to 6 times a week. Concerns: Overfishing may clear out the beds. Some restrictions would be of benefit to wild birds. Limit take to what is needed. Diggers must back fill.
30	Digs: Taw Torridge	Digs when worms are needed for own angling	Not specific but knows importance of back filling.	No. Taw Torridge is a free harbour.	No.	Regulation is not needed or workable. No concerns. Does not favour any changes. Observes more diggers in winter.
31	Digs: South Devon and North Devon	Once or twice per month	No knowledge of codes	Not in favour	Not generally in favour	Digging is restricted by weather & tide. Consider regulation for commercial diggers only. IFCA resources should be prioritised for something else.

Table 3: Other Responses

Ref No	Interest in Digging	Observations/ frequency of digging	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
02	General Public	Torbay (Broadsands) 2 to 3 diggers on site twice per month.	Has seen the IFCA information but unsure how effective they are.	Yes – Byelaw	Yes, but difficult to enforce	States that the current level of activity probably has little effect on the environment but has concerns about holes (no backfilling) being a hazard to children and dogs.
03	Recreational fisher	Not specified	No knowledge of codes which should be abolished	No	No	Managing the activity is a waste of tax payers' money. IFCA should focus on pollution problems instead.
04	Not specified	Not specified	No comments	Not specified	Not specified	Quote: " It's about time you idiots came back down to earth".
07	Member of public from Dorset	Dorset area. Not seen any diggers for a while	No comments	Yes – A Byelaw to control commercial digging	Didn't specify but feels that they could be difficult to police.	Catches should be monitored. Pleased that Devon (D&S IFCA) send out information such as consultations, but receives very little information from Dorset (SIFCA)
09	Has an ecological interest	Not specified	No prior knowledge of codes but they should be made compulsory	Yes - Byelaw	Yes – permits are a good idea	All activity done to excess should be controlled. Recreational digging is more sustainable. IFCA should prevent commercial exploitation.
10	Interest in conservation and wildlife	Has observed diggers on beaches reasonably often	No prior knowledge of voluntary codes	No	No	Although no knowledge of voluntary codes specified, stated that they are excellent for managing the activity. Believes that legislation would be unnecessary and excessive.

Ref No	Interest in Digging	Observations/ frequency of digging	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
12	Recreational Angler.	4 to 6 diggers operating most days on Plym and Tamar	Has knowledge of Exe voluntary code, but unsure of effectiveness	Not sure	Possibly a good idea but may be difficult to enforce for all users.	Concerned about excessive activity and beds not being able to recover, especially at Torpoint. If permits are used, would favour there use in all areas in case more pressure is applied to areas not regulated. Concerns about commercial activity/financial gain not being reported to HMRC.
18	Chairman of Aune Conservation Association	3 to 4 diggers operating occasionally on the Avon estuary (Devon)	States that Duchy of Cornwall already prohibits commercial digging	Yes (Byelaw) This would be a better deterrent but has concerns over effective enforcement	No. Permits wold be too complicated for the Avon.	Permits may be suitable for larger estuaries but not small areas like the Avon. Commercial digging should be restricted. Reported a lack of back filling by some diggers is a problem for walkers.
20	Owner of Erme Foreshore and Estuary Area.	1 to 4 diggers operating a few times of year, primarily on East Bank of Erme	No knowledge of codes but feels that they will not deter those with a commercial interest.	Yes (Byelaw). Codes are insufficient, and legislation is needed.	Yes. Potentially costly to introduce but necessary.	Regulation is needed in all areas. It is not sustainable otherwise.
21	Commercial Bass Line Fishermen concerned about gathering of natural food sources for fish	Observes up to 7 diggers operating on low tides in Plym	Has knowledge of Exe voluntary code.	Yes (Byelaw)	Yes	Not convinced about effectiveness of codes, but they should be regularly monitored. Legislation would better control commercial activity and provide a leisure bag limit. Commercial activity is under reported. IFCA will gain better understanding of catch levels and be able to keep activity sustainable.
23	Angler	Different levels of activity observed on Plym, Tamar & Yealm	Has knowledge of Exe voluntary code.	Yes (Byelaw)	Unsure – Difficult to enforce and apply to all users.	Commercial, rather than recreational, digging should be regulated in all areas. There must be sustainable supply for RSA sector to use. Backfilling should be encouraged

Ref No	Interest in Digging	Observations/ frequency of digging	Comments about existing Voluntary Codes	More Management Needed?	Favours the use of Permits?	Concerns, Comments & Suggestions
28	Angler	Observes up to 6 diggers on River Plym operating on average twice per week	Has knowledge of Severn voluntary code, which is effective.	Don't know	No	More in favour of voluntary codes. Not a big enough issue or impact by diggers for new legislation and permits. Possibly use permits for areas of special scientific interest and conservation areas. Codes should limit activity to hand digging only.
32 email	Honiton Sea Angling Club (secretary) & Wyvern Region of Angling Trust	Aware of digging activity, in particular the Exe, but not by 100's of recreational anglers	Has been actively involved in creation of Exe voluntary code	No	No	Favours a separate code for crab tiles and bait digging. Codes are effective when publicised enough and help to protect seagrass. Consider generic codes of conduct to apply to all areas of potential concern and always include back filling as an element of them and a limited take for own use. Considers that activity has a low impact within the exe. Consider better engagement and working together with users, estuary forums and potential assistance of angling clubs/angling trust to stress importance of content of codes and adherence to them. Recreational activity should be enough for own use. Recreational activity (digging) has wider benefits – exercise, social etc
24	Sea angling club member	Observes digging occasionally by 2 or 3 people on Plym, Yealm and Tamar	Has knowledge of Angling Trust and Federation of SAC's literature.	No	No	Legislation/permits would be an unnecessary restriction on an activity that has taken place for hundreds of years. Not aware of major concerns that can't be addressed within codes of conduct. Better publicity of codes would be beneficial.

Managing the Activity

The majority of responses indicated that knowledge of voluntary codes was lacking; however, there was a theme that the use of codes and development of them would be beneficial as compared to the introduction of legislation. Many of the responses favoured increased publicity of codes of conducts with increased use of social media and liaison with angling clubs being suggested. Others suggested implementing generic codes of conduct for all areas where the activity is likely to take place with back filling of holes a key requirement of the codes. A lack of back filling in some areas was highlighted, but other than that, the majority of stakeholders didn't raise any other major issues.

It was clear from those, that conduct the activity, that the continuing access or a "right" to collect a quantity of bait for their own use is of importance to them. The level of catch that would be suitable for personal use was not suggested by anyone who responded. Many of the active bait diggers did not have any concerns about how the activity is being conducted by recreational users or the amounts being taken. Several suggested that any form of regulation should be limited to commercial exploitation only.

The group defined as "other responses" were slightly more pre-cautionary in their views and were more sceptical about the effectiveness of voluntary codes to manage the activity. Some concerns were again raised about excessive activity or the potential that levels of activity may become excessive, particularly with commercial operators. The unregulated nature of the activity was raised as a concern and one stakeholder suggested that any financial gain from the activity would not likely be reported to HMRC. The ability to monitor catches via a regulatory framework was seen as a positive by one stakeholder but generally there was not overwhelming support for a new byelaw to be introduced.

A New Byelaw?

Most stakeholders that responded were not in favour of introducing a new Byelaw, and even less were in favour of the use of permits. The difficulties of managing the activity via legislation were considered by many to be problematic even if they had the view that legislation should be introduced. Many of the responses highlighted potential difficulties of enforcing any form of legislation and some felt that the issuing of permits to separate user groups would be a poor use of D&S IFCA time and resources.

Officer Comments

Further discussion relating to the different types of restrictions and importantly if they can be enforced effectively can take place throughout the on-going process of reviewing all Hand Working Fishing Activity. There will be "options for management" (including potential introduction of a new Byelaw) discussions when all Hand Working Fishing Activities have been subjected to closer scrutiny.

Communicating restrictions or good practice, either in a D&S IFCA Permit or a voluntary code/s is a challenge. It is impossible to be completely accurate in assessing how many recreational bait diggers operate within the District, where they dig, how often they operate and who they are. If legislation, and potentially permits, were introduced, communicating the requirements for users to obtain a permit would be difficult. If permits were implemented for all users, it is unknown how many would

require a permit. From an administration point of view this unknown quantity could place a significant burden on the Authority.

If a Byelaw (and potentially a series of permit condition requirements) becomes the chosen option to manage this activity (or any other hand working fishing activity), a threshold concept may be more appropriate, however it will still have to be combined with increased communication and awareness campaigns.

An example of a threshold concept is the Cornwall IFCA Lobster, Crawfish and Crab Fishing Permit byelaw 2016. This byelaw limits a take of species for any person to a specific level that does not have a permit. This approach separates the needs of different users. It allows hobby or occasional fishers to remove a determined quantity of resource for their own use without the need to be faced with a permit application process or more defined restrictions of use that may be suitable for more regular fishers or commercial operators. There is also an advantage to the Authority as this reduces the burden on the Authority to issue a potentially large number of recreational permits. The same concept can be applied if there is any fishing gear required, for example the managing of crab tiles.

End of Report. (29/04/19)

Version 1 (29/04/19)