

FSG125

**Papers presented at the 125th meeting of the
Fleet Study Group**

16th March 2019

FSG125

The papers presented in this document are the opinions of the authors and do not represent the view of the Fleet Study Group

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FSG125

1. Introduction

Ed Harland, Chairman, Fleet Study Group

The Fleet Study Group is a voluntary organisation that brings together a wide range of members with scientific and local interests. The common factor is that the members have an interest in the area covered by Chesil Beach, The Fleet and Hamm Beach. The Group objectives are:

- The collection, collation and dissemination of scientific, historical and other relevant information about the Fleet, Chesil Beach and adjacent areas.
- To assemble and maintain an archive of relevant information
- The identification of gaps in our knowledge and topics for future research
- The consideration of environmental effects of natural and anthropogenic changes

The Group was established in 1975 by the late Dr Elsie Burrows, a world algal authority with Liverpool University. The inaugural meeting was held at the then Dorset Institute of Higher Education (DIHE), now Weymouth College, in April 1975. The Group meets three times a year in March, July and November.

The Group does not have a formal structure or committee and has no formal funding. The only officer is the Chairman.

From time to time the Group holds symposia to discuss results of recent studies and to review the current state of the area. Symposia were held in 1981, 1985 and 1993 and the proceedings of these have been published. To mark the 100th meeting a symposium was held at Melbury House with three invited speakers covering the past, present and possible future of Chesil Beach and the Fleet. Information on that meeting can be found in Appendices B and C.

For the 125th meeting it was thought useful for members to present papers on events of the last ten years and, where possible, to look at the challenges of the present and for the future. The papers presented at the meeting were:

The Fleet Study Group activities	Ed Harland
The Fleet and Chesil Beach Reserve	Charlie Wheeler
The Natural England perspective	Maxine Chavner
Bird ring and moth trapping	Steve Hales
Plants and mammals	Jonathan Cox
Storms on Chesil Beach	Don Moxom
The future of the Fleet Study Group	Discussion

This report contains the written summaries of these papers and additional contributions from those unable to attend the meeting. All have some structure changes to give the overall document a consistent appearance. I apologise to the authors if this has significantly changed their contribution.

Over the years the Fleet Study Group has received the full support of the Ilchester Estates, which owns the principal part of the Chesil Beach and the Fleet Lagoon. This continuing support has been expressed in a letter to the group and enclosed as Appendix A to this report.

2. The Fleet Study Group; The last ten years

Ed Harland & Jon Bass

The Group has been in existence for 43 years but the objectives and group membership stay as set out in the introduction above. The present chairman took over from John Whittaker of the Natural History Museum in January 2008 at the 91st meeting.

The Group meet three times a year in March, July and November. The meetings are held at a variety of venues. These include the Ilchester Estates office in Abbotsbury, The Chesil Beach Visitors Centre at Ferrybridge, The Natural England offices at Spley Farm, Portland Port and the Wyke Regis Bridging Camp. Other venues included Charlestown church, CEFAS in Weymouth, DWT offices and the Little Bredy Walled Garden. The Group thanks all of these organisations for allowing us to meet at their premises.

Attendance and active membership over the 33 meetings are shown in Figure 2.1.

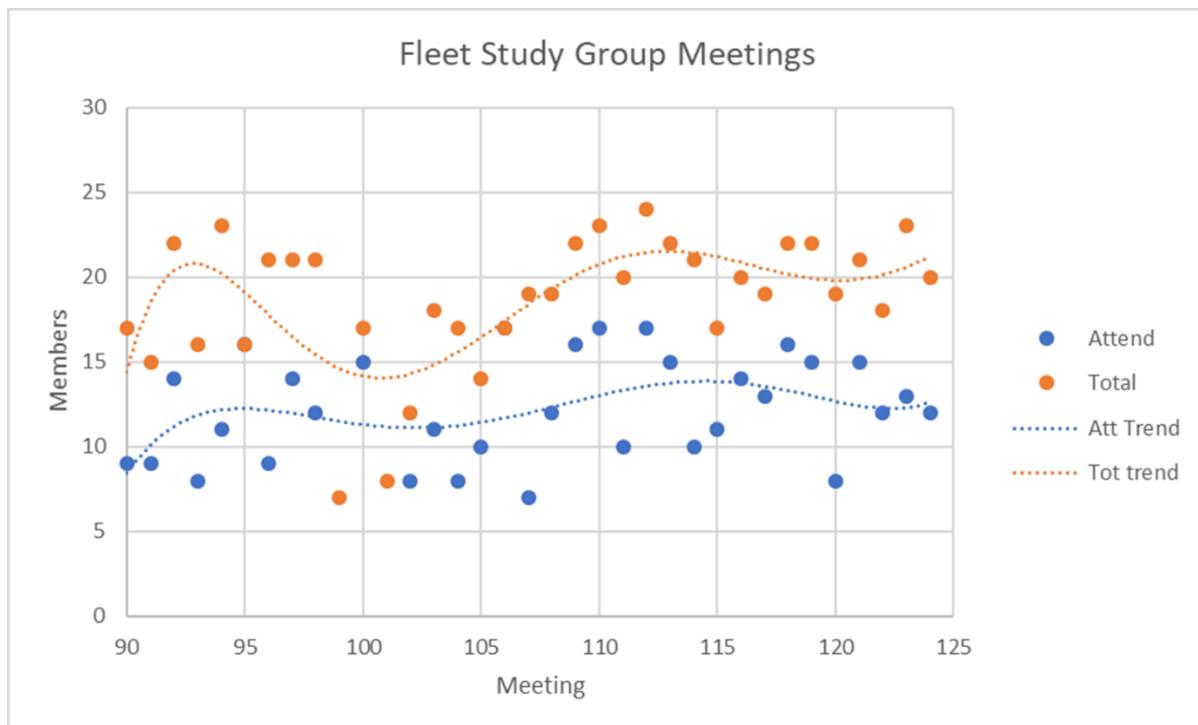


Figure 2.1 Fleet Study Group meetings

In this figure the blue dots are the number of members at each meeting while the orange dots are the number of members at the meeting plus the number of apologies for non-attendance. This 'total' is considered to be the number of active members. The two trend lines were added to try and establish any long-term change in membership levels but it would appear to be fairly constant across the last 33 meetings.

To celebrate the 100th Meeting of the Fleet Study Group three events were organised. A closed meeting with three invited speakers and an invited audience, an open meeting for the general public with presentations by FSG members and a poster exhibition at Weymouth Library.

The open meeting was held at Melbury House, courtesy of the Hon Charlotte Townshend, and covered the past present and future of Chesil Beach. The programme is shown in Appendix B to this report. It was attended by approximately 60 people.

The open meeting was held in Chickerell village hall with seven presentations by FSG members and nineteen posters also by FSG members. These posters went on to be displayed in Weymouth Library for a week. Most of these posters can be viewed on the Fleet Study Group website.

The Group has held a number of field days since 2011. These are listed in Table 2-1.

Table 2-1 Fleet Study Group field days

Year	Activity
2011	Multi-discipline visit to Clouds Hill in Upper Fleet
2012	Multi-discipline visit to Chickerell Hive/Butterstreet in Mid Fleet
2013	Litter survey, Bridging Camp to Moonfleet (five locations)
2014	Second litter survey revisiting four of the 2013 locations
2015	Litter survey at single site opposite Moonfleet Hotel
2016	Second litter survey at the Moonfleet site
2016	Preliminary visit to the Wadeway in the upper Fleet
2018	Third litter survey at the Moonfleet site

The 2011 and 2012 multi-disciplinary site studies included zooplankton traps, water temperature loggers, underwater video and light traps as well as a variety of other studies of the two areas visited.

The litter studies aimed to study the problem of litter on the Fleet side of Chesil Beach. This is a fairly sensitive area and a mass litter pick could do more harm than good to the environment. The 2013 visit looked at the types and density of the litter and then a single site opposite the Moonfleet Hotel was chosen to clear a ten-metre-wide swath of the beach of all litter. The damage this caused was noted and the 2016, 2018 and future visits are looking at how the litter returns to the cleared swath. An example of the data collected is shown in Figure 2.2.

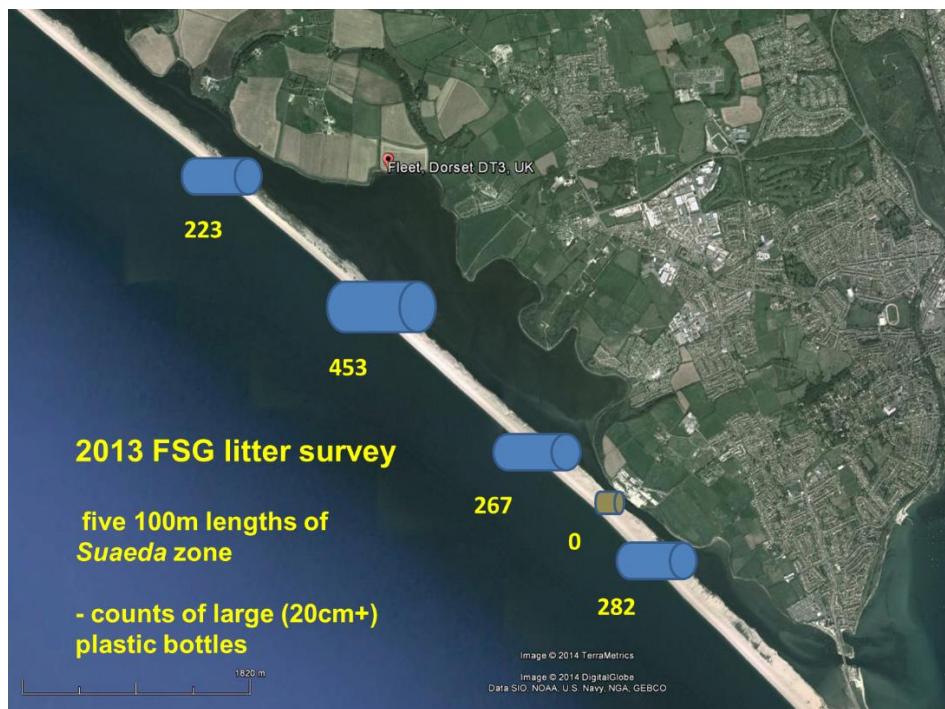


Figure 2.2 No of large plastic bottles at each litter survey site

The Fleet Study Group contributed to the Coastal Access process for the stretch from Portland Bill to Lyme Regis. A sub-group was formed and held meetings with the Natural England Coastal Access team before submitting a position paper. Because of conflicting views on the path alignment, a public enquiry was held in November 2016 at which the FSG was represented by the chairman. At the time of writing, two years on from the enquiry, the outcome is still not known.

FSG members assisted with a number of research projects including the Seagrass Initiative, lower Fleet acoustic monitoring of biological sounds, SAC fish stock assessments and drone overflights to assess seagrass condition.

FSG members have assisted Natural England with a number of monitoring surveys of designated habitats and communities between the Narrows and Ferrybridge including Saline springs and seepages (Baldock & Bass, 2011) and marine macrophytes and microalgae (Baldock, 2014). The FSG field days stimulated an overview article on Chesil Beach and the Fleet published in British Wildlife (Cox et al, 2017).

FSG members supervised an MSc student from Queen Mary University of London, studying marine invertebrate distribution changes through autumn 2013 at Langton Herring, Clouds Hill and Abbotsbury in the NW sector of the Fleet Lagoon. The most abundant groups were: Isopoda, Mysidacea, Gammaridae and *corophium* (Wills et al, 2015).

Ongoing work includes the logging of water temperatures at various points along the Fleet.

References

- Baldock,L. & Bass,J. (2011) Chesil and the Fleet European Marine Site: survey of shingle springline communities. Report to Natural England. 38pp.
- Baldock,L. (2014) The Fleet Lagoon SAC: survey of macrophytes and macroalgae. Report to Natural England. 32pp.
- Cox,J.,Moxom,D. Baldock,L. & Bass,J. (2017) Classic Wildlife Sites: Chesil Beach and the Fleet. *British Wildlife*, **28**, 4. 256-265.
- Wills,N., Bass,J. & Jones,J. (2015) Underwater light trapping of mobile invertebrates in the Fleet Lagoon, Dorset. *Proc of the Dorset Natural History & Archaeological Society*, **136**, 30-37.

3. Chesil Beach and the Fleet Nature Reserve and Abbotsbury Swannery

Charles Wheeler

Review

Birds

The past decade has been generally productive with increased numbers in recent years. For the swans some years were amongst the most successful years on record. For the Common Terns nesting on the island at the Swannery 2017 was the most successful year on record with more than 80 pairs nesting, producing 145 chicks of which 141 were ringed. Compare this with 2011 and 2012 when no chicks and 3 chicks respectively fledged.

The Little Terns also had their most successful year in 2017 with 38 nesting pairs, producing 77 chicks, of which 57 were ringed. Compare this with 2011 and 2012 when 12 chicks and 9 chicks respectively fledged.

Other breeding birds include oystercatchers, ringed plover, shelduck, barn swallows, reed, sedge and Cetti's warblers, plus many more, have all been breeding successfully through the years with some lulls due to poor spring weather affecting food availability.

New species for the reserve include Spotted and Baird's Sandpiper, Barred, Hume's Leaf and Pallas's Leaf Warblers, Bufflehead, Citrine wagtail and Ross' and Caspian Gulls.

Bird ringing by Steve Hales has continued at the Swannery and Clouds Hill.

Bats

A study of bats in and around the Swannery has started looking at distribution and roost sites. A particular species of interest is the Natusius Pipistrelle. Adrian Bicker has used Anobat detectors to look at bat species and movement. Nick Tomlinson has carried out bat trapping and also looked at call records.

Butterflies and Moths

Steve Hales and Phil Sterling have carried out moth trapping at the Swannery and in the Sub-Tropical Gardens and are now building a substantial database of species found.

Butterflies have been surveyed by the Dorset Branch of Butterfly Conservation and by PhD student Rachel Jones to map species and to particularly look for the Lulworth Skipper. Sixteen species were recorded but not the Lulworth skipper.

Mammals

Following a decline through the 1950's and 1960's Otters were last seen on the Fleet in 1972. However, over the last few years there have been increasing signs of Otter activity in the reserve and in 2015 an Otter was sighted at the western end of the Fleet. Since then tracks and spraint have been seen fairly regularly throughout the Autumn and Winter months on the Reserve. The winter camera traps have been operated and provided some excellent pictures of Otter activity.



Figure 3.1. Otter mother and cub at the Swannery

Fish

The Environment Agency and Southern Inshore Fishery Agency have conducted small fish surveys along the Fleet over the years in order to ascertain the health of the Fleet.

Research

Fleet Study Group

FSG members continue to survey various aspects of the Reserve including the Wadeway and the litter site opposite Moonfleet.

Matt Doggett has carried out drone surveys to investigate bird disturbance and to map the seagrass beds of the Fleet. These were carried out in 2017 as part of the Seagrass Initiative and repeated in 2018 for Natural England. Bird disturbance surveys have been carried out whilst these drone flights took place to record the effects on the bird life of the Fleet.

Various surveys have been carried out by FSG members looking at the effect of the 2014 storms.

Over the last ten years water temperature loggers have been deployed at the Swannery by the Reserve and lower down the Fleet by the CMMP project.

Examples of other research work

Core sampling has been carried out by Sarah Bagwell as part of ecotoxicology research into metals and PAH's and their effects on marine life and by Alix Green researching the amount of carbon stored in the UK's seagrass beds.

Matt Shepherd of Swansea University surveyed beach cusps to determine if pebble size was a factor affecting cusp size on the beach.

Shoreline invertebrate surveys have been carried out by Steve Trewella along the shorelines of the Fleet, in the dead eelgrass matter. One species re-discovered in the UK after 34 years is the springtail *Megaphorura arctica*

4. The Natural England: a marine perspective of our past, present and future work on and around Chesil & the Fleet

Maxine Chavner, NE Marine Lead Advisor for Dorset

Our remit and purpose

Natural England (NE) is the government's advisor on the natural environment. We provide practical advice, grounded in science, on how best to safeguard England's natural wealth for the benefit of everyone. It was formally established in 2006 under the Natural Environment & Rural Communities Act (NERC Act). We are an independent statutory non-governmental body.

Our remit is to ensure sustainable stewardship of the land and sea so that people and nature can thrive. It is our responsibility to see that England's rich natural environment can adapt and survive intact for future generations to enjoy. Our purpose is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

We attempt to achieve these through our statutory duties including:

- Advising government on environmental legislation and policy.
- Acting as a statutory consultee on environmental matters for planning, development and marine licensing.
- Helping farmers and landowners enhance the natural environment on their land.
- Designating our most precious environmental sites.
- Issuing and enforcing wildlife licenses for protected species.
- Commissioning and undertaking environmental scientific research, evidence gathering and driving local partnership projects.
- Have a responsibility to help people enjoy, understand and access the natural environment.

The last 10+ years...

I've tried to pick out some of the major pieces of work that NE led on or heavily fed into over the last 10 or so years:

- 2007: MSC Napoli was towed into Lyme Bay and beached at Branscombe in Devon, *en route* to Portland Harbour. Although it was beached in East Devon, the prevailing conditions meant that there were implications for designated sites in Dorset and for seabirds, of which several hundred oiled/dead/dying birds were washed up on Chesil Beach. NE staff were heavily involved in the Environment Group (responsible for providing advice to the Secretary of State's Representative on pollution matters), sometimes chairing it, to minimise the impact of the pollution and ensuing impacts of the clean-up operation.
- 2008: NE was right at the front of protecting Lyme Bay by providing robust and unequivocal advice to Defra regarding the impacts of mobile towed gear use over the Lyme Bay reefs. Using the growing evidence base from a variety of sources including Devon Wildlife Trust, Seasearch divers, fisheries data and acoustic agency data, we were able to successfully make the case that voluntary measures for protection were not appropriate and that a statutory instrument needed to be implemented (The Lyme Bay Designated Area (Fishing Restrictions) Order 2008) to ban scallop dredging and beam trawling in order to protect the site. This was followed by the designation of the Lyme Bay and Torbay Site of Community Importance (SCI), again which relied on our advice. In 2008 we supported Defra in establishing the first 3 years of a unique long-term monitoring study

assessing the recovery of reefs after the cessation of mobile towed gear. NE took on the funding of that survey, through working in partnership with Plymouth University and funded it for a number of years. The survey has now been going on for over 10 years and charted the recovery of the reefs and observed the impacts of violent storms in 2013/14 and the subsequent rapid recovery of reef communities.

- 2011: Lyme Bay and Torbay SCI designated, which was adopted by the European Commission as a Special Area of Conservation (SAC) in 2017. This provided protection for the unique reef habitats within Lyme Bay. SCIs are sites that have been adopted by the European Commission but not yet formally designated by the government of each country. SACs are sites that have been adopted by the European Commission and formally designated by the government of each country in whose territory the site lies.
- 2012: the Olympic Games saw the development of the Weymouth and Portland Sailing Academy. This generated large amounts of work for NE staff to ensure no or minimal impacts on the marine environment. We also got involved during the Games, volunteering as stewards.
- 2013: Designation of the Chesil Beach & Stennis Ledges Marine Conservation Zone (MCZ) – providing protection for pink sea-fan and native oyster, as well as intertidal coarse sediment, high energy intertidal rock and high energy infralittoral rock. Chesil Beach & Stennis Ledges MCZ was one of the original sites identified through the Finding Sanctuary Regional Stakeholder Group. Final recommendations for MCZs were developed by the group and submitted to Natural England in September 2011.
- 2014: Comprehensive macrophyte survey of the Fleet lagoon- led by Lin Baldock and Kevan Cook (NE) with a team of NE surveyors. A week long survey assessing the macrophytes in the Fleet and a report comparing with previous surveys back to Holmes 1983. It later transpired that it was a good year to have surveyed as within two years, the seagrass beds suffered a huge unexplained loss and this survey has provided a baseline prior to that loss.
- 2015: Following a governmental decision that fisheries should be considered plans or projects and were therefore no longer exempt from the Habitats Directive, all Inshore Fisheries and Conservation Authorities (IFCAs) were asked to review fisheries impacts in marine protected areas (SACs and Special Protection Areas (SPAs)) through a ‘revised approach’. Over an intense two year period, Southern IFCA reviewed all the fishing activity in Dorset, Hampshire and the Isle of Wight (including the Fleet Lagoon) against the Habitat Regulations. NE spent a lot of time working with SIFCA researching and interpreting the best available evidence and providing formal advice on each individual fishery in each site and their impacts on each feature. As a result SIFCA introduced a series of byelaws that substantially changed the level of impact damaging fisheries were having.
- 2016: Public Inquiry – England Coast Path proposals to allow access to currently undisturbed areas of the West Fleet shoreline. NE commissioned Footprint Ecology to carry out surveys of current usage of the South West Coast Path and disturbance events related to the usage, and a survey of the birds using the West Fleet and how they may or may not be impacted by the proposals. The resulting reports were used as evidence in the PI.
- 2017: A long-standing SPA feature issue was resolved by NE, regarding the legal status of little tern, wigeon and dark-bellied brent goose. In 1996, an error was made transcribing the classified features of the Chesil Beach & The Fleet SPA from the original citation to the Standard Data Form (SDF). The submission of a SDF to the EU was a new requirement in 1996 and dark-bellied brent goose was accidentally added as a feature (and recorded as the only feature). However, after a long

process, including conversations with Defra, it was determined that the citation remains the legal document confirming the classified features of the SPA, and so a corrected SDF could be submitted to the EU, finally resolving the issue after 21 years. Also in 2017, the government formally designated Studland to Portland SAC, after being SCI since 2012. Most of the work for this designation - collecting the evidence, public consultation and submitting the proposed designation to Government - took place between 2010 and 2013.

- 2018: Conservation Advice packages, developed by NE and published online, for both the [Chesil and the Fleet SAC](#) and the [Chesil Beach and the Fleet SPA](#). We have a responsibility to provide Conservation Advice for all MPAs within England's inshore waters (out to 12 nautical miles) to support sites to achieve their conservation objectives and to guide effective management. It is primarily produced for management authorities and stakeholders and it is also used by Natural England to support casework, management advice and as the framework for site monitoring planning. For SACs and SPAs, the Conservation of Habitats and Species Regulations 2017 states:

"As soon as possible after a site becomes a European marine site, the appropriate nature conservation body must advise other relevant authorities as to —

(a) the conservation objectives for that site; and

(b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated."

- 2019: NE assessed all available evidence and carried out a condition assessment for [Chesil and the Fleet SAC](#), submitted to Europe as part of our Article 17 reporting. Every six years, all EU Member States are required (under Article 17 of the Habitats Directive) to report on the implementation of the EU Habitats Directive. This most recent submission is the 4th UK report, the previous reports being 1994 – 2000, 2001 – 2006, and 2007 – 2013.

Conservation objectives

The driving force behind much of our work are the high-level conservation objectives for a designated site. They provide the framework for the Conservation Advice and the Condition Assessment and therefore inform the management of a site to prevent deterioration or disturbance of the qualifying features and highlight gaps in our knowledge of a site. They enable us or other competent authorities to consider whether a proposed plan or project is going to have a significant effect on the integrity of the site.

Chesil and the Fleet Special Area of Conservation (SAC)

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely.

Qualifying Features:

H1150. Coastal lagoons.

H1210. Annual vegetation of drift lines.

H1220. Perennial vegetation of stony banks.

H1330. Atlantic salt meadows.

H1420. Mediterranean and thermo-Atlantic halophilous scrubs; Mediterranean saltmarsh scrub.

Chesil Beach and the Fleet Special Protection Area (SPA)

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Qualifying Features:

A050. *Mareca penelope* Eurasian wigeon (Non-breeding).

A195. *Sterna albifrons* Little tern (Breeding).

The future challenge... doing the same (or more) with less

Since austerity measures were introduced, NE's funding from Defra has fallen by over 50% since 2009, with further cuts projected for 2019-20. Staff numbers have been reduced from approximately 2,700 in 2006 to 1,600 in 2019. However, we still have to deliver the same statutory work (and other work to conserve the natural environment) and so we're having to find other ways of doing it. How do we continue to provide effective protection, advice, monitoring and management of our protected sites and ensure they are achieving their conservation objectives? By getting creative:

- Creating Focus Areas to prioritise our work;
- More partnership working;
- Deliver more surveys in-house, using innovative techniques such as UAVs and eDNA sampling;
- Greater reliance on external funding;
- Liaise with local academic centres;
- Citizen science.

Dorset Coast, Cliffs and Sea Focus Area: Chesil & Fleet perspective

To help us deliver the conservation objectives for designated sites within my area team (Dorset, Hants and IoW), we have produced a number of Focus Areas, based on pressures and activities and similarities. The Focus Area that Chesil and the Fleet and Portland are part of is the Dorset Coast, Cliffs and Sea Area. The mission statement for this Focus Area is:

- We want to achieve long-term conservation gain in Dorset's open coastal and marine habitats.
- We need to foster the public's respect of the marine environment and engender support for the 'Blue Belt'.

We hope to achieve our mission statement through the following objectives:

- To promote and advise on Marine Protected Area management using a holistic, ecosystem-based approach.
- To develop a shared vision that captures the past, present and future of our coast by creating and augmenting key partnerships.
- Engage with key user groups and the wider public to be able to create a cultural shift in people's behaviours.
- To engage strategically with partners, users, residents and the wider public to foster a respect for the marine environment and MPAs, based on how we depend on it (natural capital).

They key issues for sites within the Dorset Coast, Cliffs and Seas Focus Area have been identified as fishing, angling, recreational pressures, water quality, and development. I've highlighted the three that I feel are of greatest relevance to the Fleet, Chesil and Portland, as they present the greatest potential threat to the qualifying features of both the SPA and the SAC. Water quality is one of the main drivers of unfavourable condition of the Chesil and the Fleet SAC coastal lagoon feature.

Key issues for the Fleet and Portland Harbour:

- Recreational pressures
- Water quality
- Development

The main drivers behind the creation of these Focus Areas and their individual mission statements are:

- The [Government's 25 Year Environment Plan](#), which intends to deliver a 'net gain' for future generations and leave the marine environment in a better state than we found it.
- [Natural England's Conservation Strategy 21](#), which intends to ensure England is a great place to live, with a healthy natural environment on land and at sea that benefits people and the economy.

Conservation Strategy 21 (C21) and the 25 Year Environment Plan (25YEP)

The C21 strategy sets out Natural England's thinking about what we need to do differently and how we need to work with others, to better deliver this shared ambition. It has 3 guiding principles, and a strong focus on environmental outcomes.

1. Creating resilient landscapes and seas: this includes providing advice on the designation and management of sites and wider marine environment, and monitoring their condition.
2. Putting people at the heart of the environment: working with partners, stakeholders and the wider public to promote sustainable enjoyment of the natural environment, thus raising awareness and changing behaviours.
3. Growing natural capital: recognising and raising awareness of the ecosystem goods and services we benefit from, such as carbon sequestration from seagrass beds.

The 25YEP sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. Its targets include:

- Clean air.
- Clean and plentiful water.
- Thriving plants and wildlife.
- Reduce the risks of harm from environmental hazards.
- Use natural resources more sustainably.
- Enhance beauty, heritage and engagement.
- Mitigate and adapt to climate change.
- Minimise waste.
- Manage exposure to chemicals.
- Enhance biosecurity.

Net Gain in developments – an aspect of the 25YEP

Rather than considering which level of impact may be acceptable, we are aiming to achieve an improvement for protected habitats and species or the ecosystem as a whole for each case/development. This will help us to avoid the long term degradation of our natural assets. Within the 25YEP, embedded in the '*Using and Managing Land Sustainably*' policy, is an "environmental net gain" principle for development, including housing and infrastructure. This is also being applied to marine developments. Policy and legislation already exists that is aimed at ensuring no net loss of biodiversity within developments above mean low water; the Natural Environment & Rural Communities Act 2006 and the National Planning Policy Framework 2018 (relevant excerpts below).

The Natural Environment & Rural Communities Act 2006:

Part 3 Wildlife etc. Biodiversity

Section 40 Duty to conserve biodiversity

- (1) The public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.
- (2) In complying with subsection (1), a Minister of the Crown [or government department] must in particular have regard to the United Nations Environmental Programme Convention on Biological Diversity of 1992.
- (3) Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

The National Planning Policy Framework 2018:

Planning policies and decisions should:

- encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside...

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Plans should:

- take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

To protect and enhance biodiversity and geodiversity, plans should:

- promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Surveys in 2018

Internally funded and carried out by external contractors:

- South coast tern abundance, productivity and provisioning study, which include the little terns on Chesil beach as well as other breeding tern colonies in Poole Harbour and Hampshire. This long-term project, started in 2015, is aimed at understanding the tern breeding colonies along the south coast. Its primary focus was to determine the efficacy of using food provisioning as a proxy for condition of the Solent and Dorset Coast pSPA, a proposed foraging SPA for common, Sandwich and little tern. The scope of the project has evolved since then, hence the inclusion of the Chesil little tern colony even though their foraging areas are not included in the pSPA.
- National Vegetation Classification survey of the Chesil & The Fleet SAC. This survey was to provide an assessment of the condition of the four non-marine features of the Chesil and the Fleet SAC; annual vegetation of drift lines, perennial vegetation of stony banks, Mediterranean and thermo-Atlantic halophilous scrub and Atlantic salt meadows. The last NVC survey was done in 2005 by Groome & Crowther.

In-house surveys:

- Pacific oyster / Invasive Non-Native Species survey: with the help of Angela and the MoD. Wild settlement of the non-native Pacific oyster is a major issue with the potential to displace native species and modify habitats and ecosystems (Herbert *et al.*, 2016). As there is a Pacific oyster farm in the Fleet and conditions are conducive to wild settlement, it is necessary to monitor any evidence of spatfall and wild settlement. Neither were found. The presence of other INNS, such as the slipper limpet *Crepidula fornicata*, were also noted.
- Unmanned Aerial Vehicle survey of the Fleet Lagoon seagrass beds, with the help of Charlie and Lin. Report written up by Lin and Matt. This survey carried out by our own NE UAV pilot was to follow on from previous surveys to investigate recovery of the seagrass beds after the large loss identified by the Community Seagrass Initiative in 2016.

Liaison with academia:

- Poly-Aromatic Hydrocarbon (PAH) analysis of the Fleet Lagoon intertidal and subtidal sediments by Sarah Bagwell, Bournemouth University. This work was commissioned due to the results of

sampling Sarah had previously undertaken for her PhD on bioaccumulation of heavy metals and PAHs in ragworms and birds. Her results showed alarmingly high levels of some PAHs in certain areas of the Fleet sediments. She kindly agreed to undertake further sampling and analysis of the same and additional areas to confirm her previous findings. We hope to follow her work with a more extensive survey of the Fleet sediments, consider possible sources and determine whether the cause is current or historic.

Proposed surveys for 2019

Internally funded:

- Little tern abundance, productivity and provisioning study – continuation of the project above.
- Survey of recreational activity throughout the Fleet and its shores. It has long been recognised by the reserve wardens that recreational activities are increasing along the length of the Fleet, both intensity and type. This survey will hopefully provide a heat map of the variety of recreational activities and impacts they may be having.

In-house surveys:

- Seagrass UAV survey to continue to monitor the recovery, or otherwise, of the seagrass beds.

Liaison with academia:

- Presence and distribution of *Armandia cirrhosa* (lagoon sandworm) in the Fleet and Portland Harbour – translocation – development of an eDNA primer. A PhD student from the National Oceanographic Centre, Southampton (NOCS) will be carrying out a three month internship with us between June-August and surveying for *Armandia* in the Fleet and Portland Harbour. *Armandia cirrhosa* is a Schedule 5 species on the Wildlife & Countryside Act 1981 and the Fleet and Portland Harbour are the last known locations where it is found in the UK. In the future, we will also be looking into the feasibility of a translocation to lagoons in Hampshire. I will also be working alongside a colleague in Hampshire to develop an eDNA primer for this species to make future presence/distribution surveys significantly quicker and cheaper.

External funding/partnerships

- Marine visualisation project in Portland?? Very much an aspirational project showcasing the marine environment of Portland Harbour, the Fleet and the Chesil Beach and Stennis Ledges MCZ.

The future... Brexit... ?

Potential effects for Chesil and the Fleet:

- Progression of the Environment Bill....
 - The Draft Environment (Principles and Governance) Bill 2018 sets out how we will maintain environmental standards as we leave the EU.
 - All processes like Appropriate Assessment continue as before, and all licences and consents remain valid.
 - The Secretary of State will replace the role currently undertaken by the European Commission in site designation and Imperative Reasons of Overriding Public Interest (IROPI) decisions.

- How will European regulations protecting habitats and species be converted into domestic law?
 - o When we leave the EU there will be no changes to the existing regulations on habitats, species and wild birds. Protections will remain in place from Day 1.
 - o The EU (Withdrawal) Act ensures that existing EU environmental law continues to have effect in UK law after exit.
 - o The legislation will make clear the continued role of SACs and SPAs towards delivery of Favourable Conservation Status and strategic objectives for birds.
 - o European Protected Sites will become part of a European National Sites network and afforded the same protection regardless of our EU membership.
 - What will the requirement be to report on those habitats and species?
 - o Part of the Environment Bill is the production of Environmental Improvement Plans (EIP), which will set out the steps Government must take to improve the environment, including a monitoring duty to collect date appropriate to measuring the progress of the plan and a review duty every 5 years with the results published.
 - o The creation of an independent body, the Office for Environmental Protection (OEP), which will scrutinise the government's EIP, investigate complaints of environmental law, and take enforcement actions where and when necessary.
 - How will fisheries management change?
 - o The Fisheries Bill is designed to provide legislation to create the powers the UK needs to operate as an independent coastal state after leaving the EU. It is to make provision about policy objectives in relation to fisheries, fishing and aquaculture; to make provision about access to British fisheries; to make provision about the licensing of fishing boats; to make provision about the determination and distribution of fishing opportunities; to make provision enabling schemes to be established for charging for unauthorised catches of sea fish; to make provision about grants in connection with fishing, aquaculture or marine conservation; to make provision about the recovery of costs in respect of the exercise of public functions relating to fish or fishing; to confer powers to make further provision in connection with fisheries, aquaculture or aquatic animals; to make provision about byelaws and orders relating to the exploitation of sea fisheries; and for connected purposes.
 - What impacts will a potential reduction in financial environmental incentives to farmers have on our countryside?
 - o The Agriculture Bill represents legislation to deliver a cleaner and healthier environment for future generations. Amongst other things, it will authorise new expenditure for certain agricultural and other purposes; make provision about direct payments during an agricultural transition period following the United Kingdom's departure from the European Union; confer power to respond to exceptional market conditions affecting agricultural markets; confer power to modify retained direct EU legislation relating to agricultural and rural development payments and public market intervention; confer power to make regulations about contracts for the purchase of agricultural products from agricultural producers and securing compliance with the WTO Agreement on Agriculture.

5. UAV (drone) surveys of seagrass habitats in the Fleet Lagoon

Matt Doggett and Lin Baldock

Part of the rich tapestry of life within the Fleet Lagoon includes its extensive seagrass beds. These beds are found in soft sediment areas and include the species *Zostera marina* and *Zostera noltei* along with two species of tassel weeds *Ruppia maritima* and *Ruppia cirrhosa*. The foxtail stonewort *Lamprothamnium papulosum* can also be found in dense stands.

In 2016 during surveys carried out by the Community Seagrass Initiative (CSI), a large area of seagrass die-back close to Langton Hive was identified. In October of the same year we conducted a survey using an unmanned aerial vehicle (UAV, or drone) to determine the extent of the area affected. This provided an accurate, geo-referenced data file of the area identified (Figure 1).

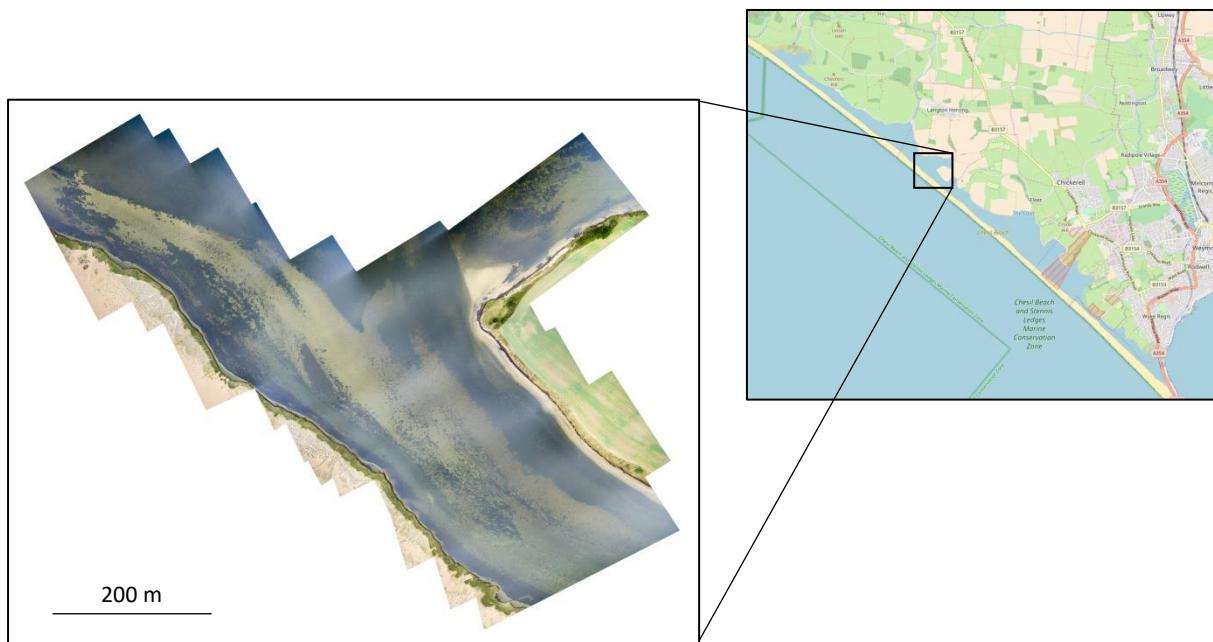


Figure 5.1: The area of bare sediment (light area) surrounded by existing seagrass (dark areas) to the south of Langton Hive in October 2016. (Map courtesy of © [OpenStreetMap](#) contributors).

In 2017, Natural England commissioned a UAV survey of the full extent of the Fleet's seagrass habitat to determine the total spatial cover and to monitor specifically the status of the area of die-back identified in 2016. The UAV survey was completed over three days in September 2017. Ground-truthing data were collected using a kayak within three weeks of the UAV survey and completed ~10 km of survey tracks.

A total area of 430 ha. was surveyed extending from Berry Knap in the west to Lynch Cove in the east. The greatest proportion of this area was colonised by *Zostera* (~200 ha.) with *Ruppia* covering ~45 ha. About 20 ha. appeared to be bare sediment while channels of deeper water adjacent to the Chesil shore and meandering across Littlesea accounted for ~45 ha.

Comparison of the UAV images collected around Langton Hive in October 2016 and September 2017 showed that there had been some recovery of seagrass in parts of the area largely due to sparse growth of *Zostera marina* with small plants of *Lamprothamnium papulosum* present in some areas.

In October 2018 we repeated a fly-over of the original area south of Langton Hive. The continued recovery of the seagrass in this area was apparent (Figure 2).

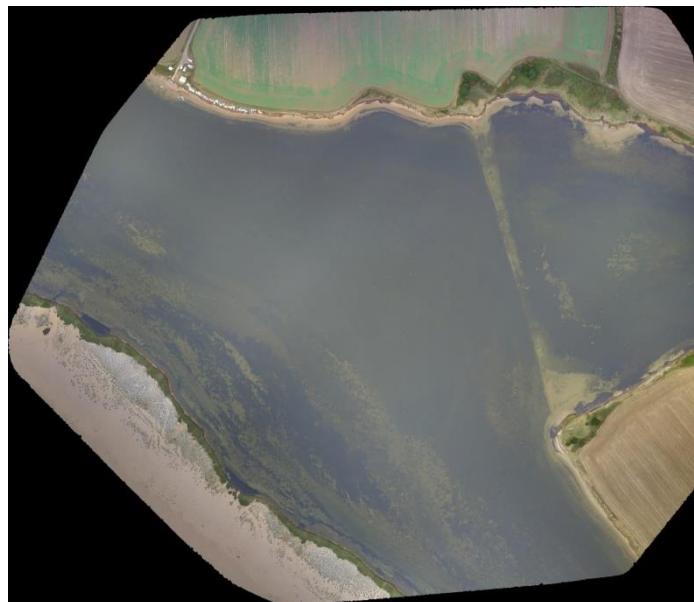


Figure 5.2: The area to the south of Langton Hive in October 2018 showing continued signs of seagrass recovery

The UAV surveys coupled with ground-truthing exercises have proven the capability to carry out relatively rapid assessments of extensive subtidal seagrass habitats, providing complete coverage of large areas. The data will serve as a valuable reference point for future lagoon-wide comparisons and aid further understanding of seagrass dynamics within the Fleet Lagoon.

The full report from the 2016-17 surveys is available on request from Natural England:

Baldock, B. and Doggett, M., 2018. Aerial survey of seagrass habitats in the Chesil and the Fleet SAC, Dorset. *Seven Tents Ecology, report to Natural England*, Report No.: D17002/R001, February 2018, 49 pp.



Figure 5.3: Looking south past the Moonfleet Hotel

6. Bird ringing and moth trapping on the West Fleet

Steve Hales

Bird ringing

Bird ringing continues at Abbotsbury Swannery and Clouds Hill on the West Fleet. Colonel Prendergast did a little ringing at the Swannery during the Autumn migration many years ago. I was invited by Don Moxom to pick this up in 1995. Since then bird ringing has taken place in the Spring and more intensively in the Autumn.

Clouds Hill

This site is like an oasis to passing birds, particularly in the Autumn when visible migration along the Fleet is substantial. Many pipits, wagtails and finches pass along the Fleet and of course will often drop into Clouds Hill. Don Moxom did some work here during the 1990's but about 3 years ago the net rides were cleared and opened up and ringing now again takes place. Some 2000 birds have been trapped and ringed here over the past couple of years. Perhaps the best recovery was that of a Lesser Whitethroat recovered (assumed shot) in Italy.

Swannery

Since 1995 some 30,000 birds have been handled at the Swannery. Most birds of course during the returning Autumn migration. The withy bed and the reeds provide considerable food source for these returning birds. Key species are Sedge warbler, Reed Warbler, Yellow Wagtail, Pied/White Wagtail and Swallows. Our Sedge Warblers have been trapped across France, Spain, Morocco and West Africa. A fat score is taken on each bird to give an indication of the health of the bird prior to migration. The Yellow wagtail roost is one of the largest in the UK in the Autumn. At peak times 1000 birds have been counted dropping into the reed bed. At times Continental subspecies have been trapped and on two instances likely birds from Scandinavia have been thought to have been processed here. The breeding Common Terns are also ringed as chicks. One bird was re-trapped on a beach in Senegal. In recent years the Black-headed Gull chicks have also been ringed.

Moth trapping

Moth traps were run regularly in the late 1990's at both the Swannery and the Sub-tropical Gardens. At both sites three Robinson type moth traps are positioned using a 125 Watt mercury vapour lamp. At times a Skinner actinic trap is also used. The traps are positioned in the same places each time to provide a constant effort with the recording. Trapping was resumed at these sites in 2017. The most common species encountered at the Swannery are those of the 'wainscot' family. Many small geometers such as Clouded Silver also occur here in large numbers in the withy bed. At the Gardens the most common moths are usually of the woodland species such as Oak Beauty, Willow Beauty, the 'footmen' family. A very rare migrant Rosy Underwing was trapped here in 2017. Of interest are the arrival of new breeding species which were not evident in the 1990's. These include Oak Rustic, Jersey Mocha and Channel Islands Pug. To date the species list for the Swannery is around 350 and that of the Gardens about 450. The number is increasing all the time as continued effort is put into recording at these interesting and diverse habitats.

7. Little tern project

John Dadds

2019 sees in the eleventh year of the Little Tern Recovery Project which was initially instigated in 2009 following discussions between the RSPB, Chesil Bank and the Fleet Nature Reserve and Natural England (NE). This resulted in a major boost to funding from NE and the introduction of new management techniques. This was set up to address the serious decline in breeding pairs during the preceding decade.

The project is managed by the RSPB with a steering group made up of supporting organisations including NE, Chesil Bank and Fleet Nature Reserve, The Crown Estate, Portland Court Leet and Dorset Wildlife Trust.

The colony at Chesil Beach lies within the Chesil Beach and the Fleet SSSI in which the little tern (*Sternula albifrons*) is a feature of interest; it is also listed as a qualifying feature of the Chesil and Fleet SPA. The little tern has Amber conservation status in the list of Birds of Conservation Concern 2015 and is protected under Schedule 1 of the Wildlife and Countryside Act 1981 and Annex 1 of the EU Birds Directive.

The little tern colony at Chesil Beach had been in decline for many years and was at risk of being lost; predation was an ongoing major issue for the colony. Breeding pairs had declined from a peak of 100 pairs in 1997 to just ten pairs in 2008, and in 2009, when food shortages were believed to be an issue, no pairs attempted to breed.

The trend changed in 2010 when nine chicks fledged from 12 pairs which was the highest productivity since detailed records of the colony began in 1976. Following this, in 2011 there was an increase of 50% in breeding population on the beach with 18 pairs fledging 12 young. In 2012, the population rose again to 21 pairs, with nine young fledged.

The drop in productivity level in 2012 was attributed to poor weather conditions in June, leading to over 60% of eggs failing to hatch. In 2013 this poor hatch rate due to chilling was addressed with the experimental addition of small patches of sand in the colony, contained by coconut matting. This was hugely successful and an estimated 30+ chicks fledged giving a productivity of 1.2 chicks per pair, the highest since records began.

In 2014, with the provision of more sand patches and on-site diversionary feeding to complement that already taking place at the Bridging Camp, 33 pairs bred on Chesil and fledged an estimated 60 young. This gave the best productivity in the whole of the UK at the time and the highest productivity ever recorded on Chesil Beach.

Since then productivity has continued to be high despite some years of high kestrel activity. Curiously, despite large numbers of fledglings for several years, the population is currently on something of a plateau with it having remained in the high 30's for the last 3 years. This would suggest that site fidelity is not guaranteed as has been assumed for many years now.

Hopefully, if the current levels of management can be sustained, then the colony will return to its late 1990's peak size of around 100 pairs. With plentiful food supply and abundant suitable nesting habitat on Chesil which, unlike many other sites in the UK is not at risk from sea level rise, there is no reason why the colony could not become much bigger and eventually be one of the largest in the country.

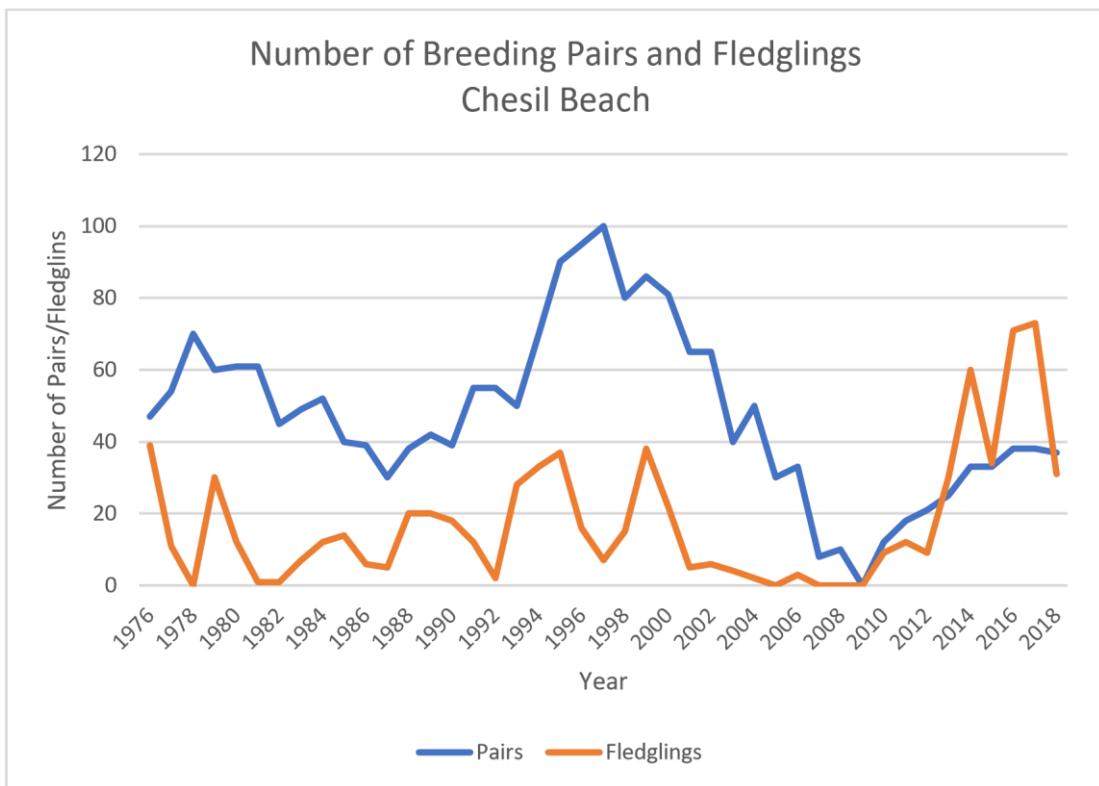


Figure 7.1 Numbers of pairs nesting and chicks fledged for the years 1976 to 2018



Figure 7.2 Productivity for the Chesil colony for the years 1976 to 2018

8. Bryophytes and small mammals of the Chesil beach

Jonathan Cox

Bryophytes surveys

Bryophytes surveys are ongoing, carried out when opportunities arise, and with the goal of surveying all areas of the beach. The majority of bryophytes records are from the more sheltered areas on the leeward side of the shingle bank. Epiphytic species include Frizzled Pincushion *Ulota phyllantha* on blackthorn branches and Green Yoke-moss *Zygodon viridissimus* on the trunks and branches of shrubby seablite. Whitish Feather-moss *Brachythecium albicans* and Great Plait-moss *Hypnum lacunosum* occur in maritime turf, and Yellow Crisp-moss *Tortella flavovirens* is found on thin soil near the Fleet. Old concrete supports Grey-cushioned Grimmia *Grimmia pulvinata* and Silver-moss *Bryum argenteum*. A moss occurring on a range of substrates is Capillary Thread-moss *Bryum capillare*, which occurs in maritime turf and on shingle near the Fleet, as well as less frequently on mats of old dried seagrass and on weathered flotsam such as old rope and old leather shoes. Another unusual flotsam record is *Ulota phyllantha* found colonising an old and weathered piece of expanded polystyrene. It is hoped to eventually combine the results of this survey with previous records in a short publication.

Small Mammals surveys

Surveys for small mammals on Chesil Beach have been carried out by both Longworth live-trapping and field observations. Longworth traps have been used on two occasions as part of Fleet Study Group field events, and revealed that Wood Mice *Apodemus sylvaticus* are frequent in some areas of the beach. Studies have been made of nests and feeding remains, most often found beneath washed up logs, posts and other larger items of flotsam. The fruiting heads of Sea Campion, which is a frequent plant in many areas of Chesil Beach, provide both food as seeds and also nesting material in the form of the dried papery husks. Other food remains recorded in smaller amounts include the seedheads of Curled Dock, Sea Kale and Sea Pea, and the opened shells of Garden Snails. Occasional records of mouse-opened Hazelnut shells on Chesil Beach, far away from any Hazel bushes, probably indicate the harvesting of flotsam nuts washed in by the sea. Pygmy Shrew *Sorex minutus* was recorded on two occasions, and there are older records of Field Vole *Microtus agrestis* from Chesil Beach.

This study of small mammals led to a review of all mammals recorded on Chesil Beach and in the Fleet, with the exception of washed-up cetaceans (Cox & Moxom, 2013).

Reference

Cox, J.H.S. & Moxom, D. 2013. Mammals of Chesil Beach and the Fleet. *Proc. Dorset Nat. Hist. & Arch. Soc.* **134**, 38-42.

9. Storms on Chesil beach

Don Moxom

Thanks to data gathered by members of the Fleet Study Group (FSG) and the Channel Coastal Observatory over the last 10 years we have detailed information about storms and their dynamic effects on the 'undefended' stretch of Chesil between Abbotsbury and the Fine Foundation Chesil Beach Centre near Ferrybridge. The Chesil and West Bay Directional Waverider Buoys in this period have produced reliable data on 29 storms with wave heights exceeding 4m that have the capacity to move significant quantities of shingle. In every year (except 2010) at least one storm generated maximum wave heights over 5m, 6m events occurred in 3 years, 2009, 2015 and 2017 with 7m events in 2013 and 2014.

In the major storms of December 2013 and February 2014 thousands of tons of shingle were thrown over the crest of the beach. Flattened beach huts and the road behind the beach at Abbotsbury lying knee-deep in pebbles confirmed the unusual severity of the storms. Alongside government Agencies who re-assessed flood risk to Chiswell and conducted emergency beach repair work in 2014 the FSG members conducted voluntary surveys of the pre- and post-storm Chesil vegetation and analysed litter deposits at locations between Abbotsbury and the Chesil Beach Centre. FSG surveys also revealed the extent of storm-generated changes to the beach by comparing satellite imagery with walk-over GPS measurements at the beach crest and a new wave-wash over strandline boundary created at the rear of the beach. In a number of locations the beach crest height was lowered by 0.5-1.0 metres, exposing the roots of vegetation, and in isolated spots the crest was lowered by two metres. The volume of wave-water coming over and through the crest during these storms was so great that it dragged deep fans of pebbles into the Fleet. Large areas supporting nationally rare shingle and saltmarsh vegetation experienced major changes overnight. In examining the extent of the over-wash FSG surveys found that shingle and marine drift debris had reached the shoreline of the Fleet lagoon in many places in 2014.

Following storms seagrass heavily laden with water-born sediment was photographed and huge deposits of washed up seagrass observed along the Fleet shore. After the 2013-2014 storm events there were extensive areas where seagrass was absent in the mid-Fleet zone where seasonal growth has always been strong. FSG members, with encouragement from Natural England, supported contractors and Citizen Science projects to monitor the seagrass recovery using a variety of techniques. Quadrat surveys of seagrass were conducted several times (2015-2018), overlapping with the start of drone overflights and underwater GoPro imagery revealing more precise information on seagrass dynamics following the 2013/14 storm events. FSG members have also contributed to deployment and recovery of remote logging devices.

It is in the character of the fauna of saline lagoons to tolerate extremes in water temperature, salinity, turbidity and turbulence but whether the Fleet's fauna and flora will be able to endure greater stress in the longer term remains to be seen. At Abbotsbury Swannery in 2011, a specially designed 150 metre revetment was constructed to protect the adjacent duck decoy, England's oldest working decoy which is of significant heritage value.

After major storm events the deposit of polythene and plastic rubbish on the Chesil can be mobilised by wind and floodwater, blowing across the Fleet to the landward shore and requiring careful and costly removal from sensitive habitats. The repeated FSG litter surveys (2013-2018) have recently indicated a drop in the quantity of plastic items washing up on the outer flank of Chesil, though litter arrival rates are highly irregular over time. The impacts of storm changes are dramatic but other more subtle factors can be overlooked. Long-term observations on the Fleet and Chesil encouraged by the FSG, remain a valuable resource that can inform management decisions and their consequences for organisations, landowners, tenants, visitors and the wildlife communities.



The blue line marks the wave-wash over strandline boundary created at the rear of a section of the beach opposite West Fleet in the 2014 storm, and is typical of the boundary elsewhere. The image has kindly been provided by FSG members, Lin Baldock and Jon Bass, who also carried out the survey.

10. Portland Port

Frank Cox

Portland Port Group is a commercial port and statutory harbour authority situated in Portland Harbour, Dorset. As a commercial port, Portland Port serves as a destination port for a diverse range of activities with examples including Cruise visits, a cargo port capable of accommodating Panamax sized vessels and frequently provides layup services for vessels. The typically clear waters of the harbour provide an excellent location for in water services and inspections, and the close proximity to the main English Channel shipping lanes mean we are in an ideal location to provide bunkering (refuelling) for vessels. The sheltered waters of the harbour are also of interest for many other users including military with its 2 ranges, watersports (sailing, windsurfing and kite surfing) and aquaculture as examples. In the case of aquaculture the harbour has been of particular interest for longline aquaculture of mussels, oysters and scallops, and more recently trials on seaweed aquaculture have commenced.

As a statutory harbour authority, we have in place the Portland Harbour Revision Order 1997, which defines the limits of our jurisdiction and confers upon them powers of control, operation, management and regulation in relation to the harbour and the harbour premises. The Order provides for the development and for the safe and efficient operation of a commercial port; for harbour conservancy and maintenance; for the management and encouragement of recreation and commerce; and for the conservation of the natural beauty of the harbour and its flora and fauna. It also includes for a Harbour Consultative Committee which is formed of stakeholders representing all users of the harbour including environment, leisure, commercial and statutory regulators.

The port operates in accordance with, and is audited against the Port Marine Safety Code. We also have in place various plans approved by the authorities including Emergency Plans, Oil Spill Contingency Plan and Waste Management Plan. These detail the contingency arrangements for responding to incidents of all sizes both on land and in the harbour. The Port have trained personnel to deal with incidents and can call on emergency response contractors Adler and Allen if additional support is required.

Proposed works and operations whether on the land estate or within the marine jurisdiction are assessed against relevant legislation and in doing so take account of designated nature conservations sites such as Hamm Beach and the Fleet. Of specific relevance to Hamm Beach, in view of the increasing leisure use in the Hamm Beach area, a user group has been established to inform its management.

11. Geology of the Fleet and Chesil Beach

Alan Holiday

The Fleet cuts across a significant part of the Weymouth Anticline, a dome shaped east west fold that was formed around 25-30 million years ago during the Alpine Orogeny (mountain building episode). All the rocks exposed are Jurassic in age from around 170 to 155 million years old. The oldest rock seen along the Fleet is the Frome Clay also known as the Fullers Earth Clay. This is seen around from Rodden Hive Point south to Langton Hive Point through to Herbury. The most interesting aspect of this unit is the oyster lumachelle seen at Langton Hive Point where countless oysters (*Ostrea hebridica var elongata*) can be seen exposed in the low cliff. At Herbury the boundary between the Frome Clay and the Forest Marble can be seen and is marked by the Boueti Bed with large numbers of the brachiopod *Rhynchonella boueti*. It is unfortunate that access to this significant site is restricted by the landowner.

At the Moonfleet Hotel the beach section has a good exposure of Forest Marble, a broken shell limestone which is very well cemented interbedded with clay. The sometimes oolitic limestone has a rich fauna with fragments of bivalves, brachiopods, crinoids and bryozoan. The beach just to the north of the access point has good sedimentary structures (ripple marks) and trace fossils (where creatures crawled over the sea floor when the sediment was still soft). Further south at Butterstreet Cove the Cornbrash is exposed. This is a rubbly limestone producing a stony or brashy soil. Good examples of honeycomb weathering can be seen in the exposures on the north side of Butterstreet Cove. Inland the rock is more interesting with more fossils for example on the field surface just west of Fleet Lodge where a variety of bivalves and brachiopods have been found recently.

Above the Cornbrash is the Kellaways Beds and the Oxford Clay. The former is poorly exposed but south of Chickerell Hive Point good examples of septarian nodules can be seen on the beach. These are carbonate rich, flattened concretions which can be as much as 60 cm across. Between Chickerell Hive Point and Tidmoor Point Oxford Clay is seen with ammonites (*Kosmoceras compressum*) also seen in the Crook Hill Council Depot (former brick pit). This SSSI is very overgrown but it is hoped that conservation work by local geologists can make the site accessible again. Tidmoor Point exposes the Oxford Clay and very wet weather in early 2018 resulted in many good examples of *Quenstedtoceras lambertii* being found. Further south in Tidmoor Cove a number of good ammonites (mariae zone) were found during the FSG survey in 2016.

Moving south to the Camp Road section Corallian Limestone is exposed with good sedimentary structures (cross bedding) as well as trace fossils (Skolithos) and the irregular echinoid *Nucleolites scutatus* being found. South of Pirates Cove the Kimmeridge Clay is exposed with the most common fossil *Ostrea delta* being found.

Similar rocks to those described above can be seen north of Langton Hive Point to Shipmoor Point but access is restricted with the Coast Path being directed inland.

12. Future of the Fleet Study Group

At the end of the meeting there was an open discussion of various aspects of Fleet study Group activities in the past present and future. The main points to arise were:

- a) We need to improve our web site and electronic communication. A number of ideas on how this can be achieved were discussed and these will be pursued in the coming months.
- b) The Fleet Study Group archive was discussed and it was suggested that this could be a student project to digitise the documents and put them into an electronic database.
- c) Group field days were discussed and it was agreed that we would return to the multi-discipline approach used in 2011 and 2012. Ideas were requested for sites to visit so that these could be circulated to members.
- d) The Fleet Study Group is an un-funded voluntary group. A discussion took place on whether we should move to a more formal structure with a committee and funding. It was also discussed whether the group should get involved with public events and/or citizen science. However, it was not clear where such funding would come from and whether such a change would be beneficial. With time running out this discussion did not reach a conclusion. For the time being the group will stay voluntary and un-funded.

13. Appendix A; Letter received from Ilchester Estates



ILCHESTER ESTATES

The Estate Office
Melbury Sampford
Dorchester
Dorset
DT2 0LF

13th March 2019

Tel: 01935 482200

Mr E Harland
Chairman, Fleet Study Group
5 Bramdon Lane
Portesham
Dorset
DT3 4HG

Dear Mr Harland,

125th Fleet Study Group Meeting

On behalf of Mrs Townshend, I write to pass on her sincere and personal thanks to you and the members of the Fleet Study Group for your dedication and hard work which provides invaluable scientific information for such an important ecosystem.

We are incredibly proud to be the custodians of the Chesil Bank and Fleet Nature Reserve and the Fleet Study Group is to be congratulated for reaching 125 meetings. We sincerely hope that this continues for another 125 meetings and beyond.

Yours sincerely



B D Jones
Resident Agent

A handwritten signature in black ink, appearing to read "B D Jones". Below the signature, the name "B D Jones" is printed in a bold, sans-serif font, followed by "Resident Agent" in a smaller, regular font.

14. Appendix B: Programme for FSG100 closed meeting

FSG100

The Fleet Study Group

Chesil Beach: Past Present and Future

**A seminar exploring the origins, present state and possible
future of Chesil Beach, Dorset
Melbury House, 11th November 2010**

Programme

- 1:30 Registration in the Billiard Room
- 2:00 Introductions
 - Welcome to Melbury House by Ben Jones, Ilchester Estates
 - Introduction by Ed Harland, Chairman of the Fleet Study Group
 - Introduction to the meeting by Denys Brunsden
- 2:25 The formation of Chesil Beach. Malcolm Bray of Portsmouth University
- 3:00 Beach dynamics and current monitoring. Andy Bradbury of the Channel Coast Observatory
- 3:35 Tea break
- 4:00 The future of Chesil Beach. Nick Lyness of the Environment Agency
- 4:35 Chaired discussion
- 5:15 Meeting closed

15. Appendix C: Programme for the FSG100 open meeting

FSG100

The Fleet Study Group

Chesil Bank and the Fleet

A series of talks exploring aspects of the Chesil Bank and the Fleet, Dorset
Willowbed Hall, Chickerell, 15th November 2010

Programme

- 7:30 **Welcome and introduction** by Ed Harland, Chairman of the Fleet Study Group
- 7:40 **Chesil and the Fleet: What is special about the area?** by Rachel Waldock of Natural England
- 7:55 **The formation of Chesil Beach** by Richard Edmonds of the DCC World Heritage Site Team
- 8:10 **Biological importance of the Fleet and Chesil Bank habitats** by Bryan Edwards of DCC
- 8:25 **Introduction to the posters** by Ed Harland
- 8:30 Tea break, posters and rolling display of pictures of the area
- 9:00 **Portland Harbour – a perfect location** by Sandie Wilson of Portland Port
- 9:15 **Archaeology of the Fleet** by Gordon Le Pard of DCC
- 9:30 **Human influences today** by Don Moxom, Warden of the Fleet
- 9:45 **Conclusion and questions**
- 10:00 Meeting closed

If, after the meeting, you would like more information on the area, why not visit the Chesil Beach Visitors Centre located in the Beach Road car park at Ferrybridge or visit our website www.chesilbeach.org.