Opportunities for Postgraduate Research at Slapton Ley Field Centre and National Nature Reserve

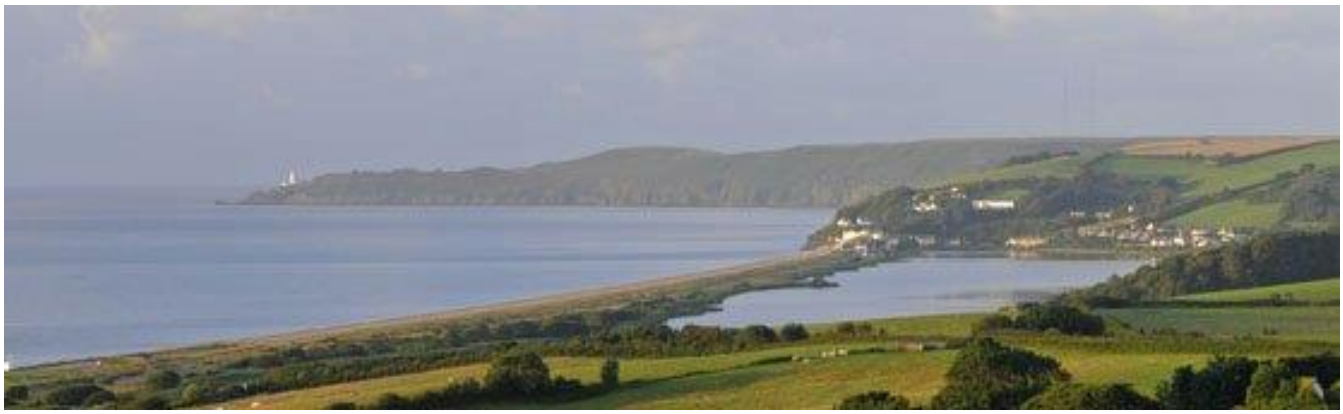

Figure 1. Slapton Ley landscape and habitats.

INTRODUCTION

Slapton Ley provides a wide range of opportunities to contribute to an active programme of research building on a history of research since the Field Centre was established in 1959. The National Nature Reserve comprises coastal, wetland and woodland with Field Centre staff support and facilities.

SLAPTON LEY NATIONAL NATURE RESERVE

Slapton Ley is a coastal lagoon 10km south west of Dartmouth shown in figures 1 and 2. The wetland is divided into the Higher Ley (39 ha) is mainly reedbed; the Lower Ley (77ha) is open water, fringed with reed. The freshwater Ley is separated from the sea by a 4km gravel barrier beach and shingle ridge. Together with surrounding woodland it is designated as a Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). In 2005 the adjacent Loworthy Fields were included within the complex.

BENEFITS OF RESEARCH AT SLAPTON LEY

Support from field centre staff, data and access to field sites are provided free.

- **FSC Staff Support.** Local knowledge and practical advice on locations, field sites and access agreements. Supporting data collection.
- **FSC Safety Systems.** Exemplar risk assessments for field sites and fieldwork. Indirect supervision for lone working field researchers.
- **Environmental Context.** Existing studies provide an environmental context for new research.
- **Meteorological Data.** Meteorological records since 1959, collected in line with Met Office standards.
- **Long-Term Data.** Free access to 50 years' data to identify trends.
- **National Nature Reserve.** Nationally important species, biodiversity and geomorphology. Studies influence management policy and practice.
- **Secure Site.** Safe installation of monitoring equipment. Field sites managed to support data collection with long-term tenure.
- **Facilities.** Accommodation, lab and teaching facilities for individual researchers and groups at the Field Centre. A bursary is available to support accommodation costs.
- **Field Course and Placement Links.** Studies can be used to support Field Courses or completed on work based learning placements.
- **A Level Field Courses.** Work with A Level geography and biology students on field courses and support transition to University.

ACCOMODATION AND TRAVEL BURSARY

For researchers wishing to carry out work at Slapton, provision of accommodation at the Field Centre and a limited travel bursary is offered by application. This will be awarded on a case by case basis. Please get in touch for more information.

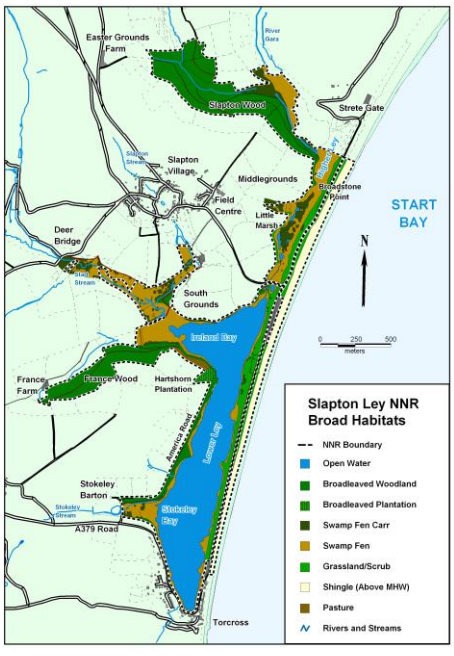

Figure 2. Nature reserve environments.

BUILDING ON A WEALTH OF RESEARCH

The long tradition of research since the Field Centre was established in 1959 is summarised by Burt & Heathwaite (1996). This provides a brief review of over 35 of the more recent papers using the same areas of study:

Climate. Since 1959 meteorological readings are recorded daily and contribute to Met Office records. Burt & Horton (2001) note the favourable mild and moist climate as well as climate change, particularly increasing temperature. These data are very valuable for numerous long and short term ecological, hydrological and coastal studies.

Hydrology. Weekly monitoring established in 1969 continues to present, providing a unique record of a small catchment. Burt & Heathwaite (1996) summarise the most significant area of research in the 1980s & 1990s focusing on subsurface runoff and overland flow. Birkinshaw & Webb (2010) continue the study of Slapton Wood catchment, focusing on sub-surface streamflow using temperature tracers.

Water Quality. Weekly monitoring started in 1969 continue to be collected. Burt & Heathwaite (1996) summarise studies of nutrient export from land to stream, focusing on nitrate, phosphorus and potassium. Burt et al. (2010) put the Slapton nitrate issue in a UK context in comparison with other river catchments. Burt & Worrall (2009) update the Slapton Wood nitrate record, a unique 35-year record for a small catchment (fig 3). Long-term work continues to consider the impact of water quality on macroinvertebrates in the Ley (Hosking et al 2015).

Limnology. Weekly measurements of chlorophyll, dissolved oxygen and conductivity continue to be collected. Studies are summarised by Johnes & Wilson (1996). Burt & Heathwaite (1996) call for research into the impact of nutrient enrichment on the water chemistry of the Ley. Slapton Ley is an important area for macrophytes (Stewart 2004). These have been monitored annually since 1998 and the threats identified by Lambert (2007).

Sediment Yields. Weekly samples continue to be collected. Sediment dynamics are reviewed by Burt et al. (1996) and lake and floodplain sedimentation in Start valley is reviewed by Foster et al. (1996).

Vegetation. Bennett (2010) provides an NVC classification of the wetlands, a baseline survey and identifies the need to control succession in the fens. Nationally-rare Strapwort populations (figure 5) are recorded annually since 1978 and the factors affecting it are identified by McHugh (2007). Numerous undergraduate studies of shingle ridge vegetation highlight the impacts of exclosure plots and trampling. There are few studies of woodland flora and tree surveys in Slapton Wood and France Wood. Loworthy fields were surveyed with recommendations for management made by Streeter (2011).

Fungi. Dobson & Hawksworth (1996) identify the richest record of fungi in the world. Lichen surveys have been updated by Edwards (2009). However, there is a need for an interpretation of this data (Burt & Heathwaite 1996) particularly in the relation to Ecosystem Services.

Fish. Kennedy (1996) reviews 25 year records of roach, rudd, perch & pike. Scott (2003) investigates the impact of eutrophication on fish health. Bark et al. (2007) indicate the high density eel population and its importance for spawning and escapement in the UK.

Mammals & Other Animals. Riley (1996) reviews otters & mink studies including work by Chanin & Linn (1980) as well as numerous records and observations by staff and visitors. Guillem et al. (2012) apply the use of chemo-taxonomy of host ants to help conserve the Large Blue butterfly. Stone et al. (2009) and Goerlitz (2012) have undertaken specific bat behavioural studies. Summer monitoring contributes to national "citizen science" programmes for Lesser Horseshoe & Daubenton's bats since 1998, Common Dormouse since 2001 and Butterflies since 2006.

Birds. BTO ringing (at Slapton Bird Observatory) and WeBS surveys carried out since 1959 are summarised by Elphick (1996). Whitehall (2007a) maps a range of species, notably including Great Crested Grebe (Whitehall 2007b), and Cetti's Warbler (Whitehall 2009. Few studies have identified factors affecting bird populations, e.g. Cetti's Warbler (Ward 1998). Slapton Ley is an important staging site for migrating birds including White Wagtails (Elphick 2012) and Swallows (Elphick 2011).

Education. Recent studies have started to consider pedagogy at different stages of education. Stokes & Gibson (2008) review student experiences of fieldwork. Welsh & France (2012) consider the use of smartphones for fieldwork. Pether (2012) considers the leadership needed to embed outdoor learning in the curriculum. Increasingly there is consideration of the impact of fieldwork on the wider environment. Weekly energy & water consumption has been recorded since 2002 and have been analysed against overnight visitor numbers to Slapton by Hale (2015). Ribchester, Hunt & Alexander (2009) compare the carbon footprint of UK fieldwork at Slapton Ley with overseas trips.

Coastal Landforms. There is a long history of studies of the South Hams coastal geomorphology, much of it conducted using the field centre as base location. Austin & Masselink (2006) study of morphological landforms and processes affecting the gravel barrier beach provides a much more detailed analysis using more high tech instrumentation (fig. 4) that supersedes student data summarised by Job (1993). Scott Wilson (2006) evaluates the wide ranging impacts of losing the A379. Royal Haskoning (2007) model the evolution of the barrier as a result of climate change and the impact of a breach on the wetlands.

DEVELOPING A RESEARCH PROJECT

FSC staff can provide support for your individual interest area or provide suggested topics building on existing studies in Table 1. Researchers should complete the Application Form (Appendix 1).

No.	Study Area	Suggested topic	Data available	FSC staff
1	Climate	Recent changes in climate since 2001	Digitally from 1960-present	Andy Pratt
2	Water quality	Spatial and temporal patterns of water quality in the Slapton Ley catchment area.	Digitally from 1982 - present	Nick Binnie
3	Limnology	The impact of nutrient enrichment on the water chemistry of the Ley	Digitally from 1982 - present	Nick Binnie
4	Vegetation	NVC survey of shingle ridge in order to inform possible realignment of A379 following storm damage.	Species lists	Andy Pratt
5	Vegetation	France Wood, 100 year plan, implications of Ash Dieback.	Species Lists	Debbie Gregson
6	Vegetation	The impact of changing car park locations & scenarios on the shingle ridge	Species Lists	Andy Pratt
7	Vegetation	An evaluation of the impact of exclosures on vegetation over 35 years	Occasional data 1978 - present	Andy Pratt
8	Vegetation	Comparison of ancient woodland in Slapton Wood and plantation in France Wood using published protocols for biodiversity assessments	Species Lists	Debbie Gregson
9	Vegetation	A history of Slapton Wood.	Species Lists	Andy Pratt
10	Fungi	An assessment of Fungi status & trends with reference to Ecosysystem Services	Species Lists	Andy Pratt
11	Fish	Current fish populations, evaluating the impacts of the fishing moratorium.	Digitally from 1974 - 2001	Nick Binnie
12	Animals	Comparison of ancient woodland in Slapton Wood and plantation in France Wood using published protocols for biodiversity assessments.	Species Lists	Debbie Gregson
13	Animals	Factors affecting butterfly populations on Loworthy Fields (including weather & management).	Digitally from 2011-2013	Maryanne Wills
14	Birds	Factors affecting Cetti's Warbler populations or behaviour (including weather & management).	Population 1996 – 2008 & maps	Nick Binnie
15	People	The human response to changes in NNR management.	n/a	Andy Pratt
16	People	Assessing the impact of SLFC's activities on field sites and populations.	n/a	Andy Pratt
17	Vegetation	Comparing the recovery rates of staged cutting of sycamore in France Woods.	Species Lists	Debbie Gregson
18	Education	Considering the value of outdoor learning and the impact of residential field work at Slapton Ley Field Centre.	n/a	Andy Pratt

Table 1. Suggested Topics for Research Projects.

ANNUAL RESEARCH SEMINAR

Researchers involved in projects on the NNR are asked to present their work to academics, professionals and amateur naturalists at the Annual Research Seminar held at Slapton. This provides opportunities to keep up to date and discuss current studies as well as develop new projects and make new contacts.

CONTACT DETAILS FOR MORE INFORMATION

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Figure 3. Nationally rare Strapwort.

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Updated Feb 2016