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

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.

ACCOMMODATION AND TRAVEL BURSARY
For researchers wishing to carry out work at Slapton, provision of accommodation at the Field Centre supported by a limited bursary. This will be awarded on a case by case basis on application.
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 surface streamflow using temperature tracers.


**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 enclosure plots and trampling. There are few studies of woodland flora and tree surveys in Slapton Wood and France Wood. Lowsorly 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. Guilleml 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 downloadable from www.slnnr.org.uk or from research.sl@field-studies-council.org.

<table>
<thead>
<tr>
<th>No.</th>
<th>Study Area</th>
<th>Suggested topic</th>
<th>Data available</th>
<th>Skills Needed</th>
<th>Support Available</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Climate</td>
<td>Recent changes in climate since 2001</td>
<td>Digitally from 1960-present</td>
<td></td>
<td>FSC Staff recorders</td>
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<tr>
<td>2</td>
<td>Water quality</td>
<td>Spatial and temporal patterns of water quality in the Slapton Ley catchment area.</td>
<td>Digitally from 1982 - present</td>
<td></td>
<td>Volunteer recorders</td>
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<td>3</td>
<td>Limnology</td>
<td>The impact of nutrient enrichment on the water chemistry of the Ley</td>
<td>Digitally from 1982 - present</td>
<td></td>
<td>Volunteer recorders</td>
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<tr>
<td>4</td>
<td>Vegetation</td>
<td>A review of France Wood, 100 year plan, implications of Ash Dieback, climate change.</td>
<td>Species Lists</td>
<td></td>
<td>FSC Staff</td>
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<td>5</td>
<td>Vegetation</td>
<td>The impact of changing road &amp; car park locations &amp; scenarios on the shingle ridge</td>
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<td>Slapton Line Partnership</td>
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<td>6</td>
<td>Vegetation</td>
<td>An evaluation of the impact of exclosures on vegetation over 35 years</td>
<td>Occasional data 1978 - present</td>
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<td>7</td>
<td>Vegetation</td>
<td>Comparing ancient woodland in Slapton Wood and plantation in France Wood.</td>
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<td>8</td>
<td>Vegetation</td>
<td>A history of Slapton Wood.</td>
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<td>9</td>
<td>Fungi</td>
<td>An assessment of Fungi status &amp; trends with reference to Ecosystem Services</td>
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<td>10</td>
<td>Vegetation</td>
<td>Assessing the impact of cutting sycamore in France Woods</td>
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<td>Fish</td>
<td>Current fish populations, evaluating the impacts of the fishing moratorium.</td>
<td>Digitally from 1974 - 2001</td>
<td>Fish survey skills</td>
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<td>12</td>
<td>Animals</td>
<td>Comparing ancient woodland in Slapton Wood and plantation in France Wood.</td>
<td>Species Lists</td>
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<td>13</td>
<td>Animals</td>
<td>Factors affecting butterfly populations on Loworthy Fields (e.g. weather &amp; management).</td>
<td>Digitally from 2011-2013</td>
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<td>Volunteer recorders</td>
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<td>14</td>
<td>Birds</td>
<td>Factors affecting Cetti’s Warbler populations or behaviour (e.g. weather &amp; management).</td>
<td>Population 1996 – 2008 &amp; maps</td>
<td>Bird ID skills</td>
<td>Volunteer recorders</td>
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<td>15</td>
<td>People</td>
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</tbody>
</table>

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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REFERENCES


Elphick, D., (2011) Additional Slapton Ley NNR Swallow (Hirundo rustica) data, 2002-2010. Devon Birds,64.2-3-10


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Streeper (201) Hedgeland, Loworthy Farm, Slapton. Unpublished


Andrew Pratt and Lewis Winks, Updated August 2017