

Research at Slapton Ley



Slapton Ley National Nature Reserve

Slapton Ley is a coastal lagoon 10km south west of Dartmouth. 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

- **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.** Access to 50 years' data to identify trends.
- **National Nature Reserve.** Nationally important species, biodiversity and geomorphology. Opportunities to influence management policy and practice.
- **Secure Site.** Safe installation of monitoring equipment. Field sites managed to support data collection with long-term tenure.
- **Staff Support.** Practical advice on locations, field sites, access and management protocols. Supporting data collection.
- **Facilities.** Accommodation, lab and teaching facilities for individual researchers and groups.



Current Areas of Study

A brief review of research summarised in categories established by Burt & Heathwaite (1996):

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 subsurface streamflow using temperature tracers.

Water Quality. Weekly monitoring continues to present. 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.

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 until present. 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. Strapwort populations (Nationally-rare) 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. 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 these data (Burt & Heathwaite 1996).

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 (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. 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 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.

Suggestions for undergraduate & postgraduate studies

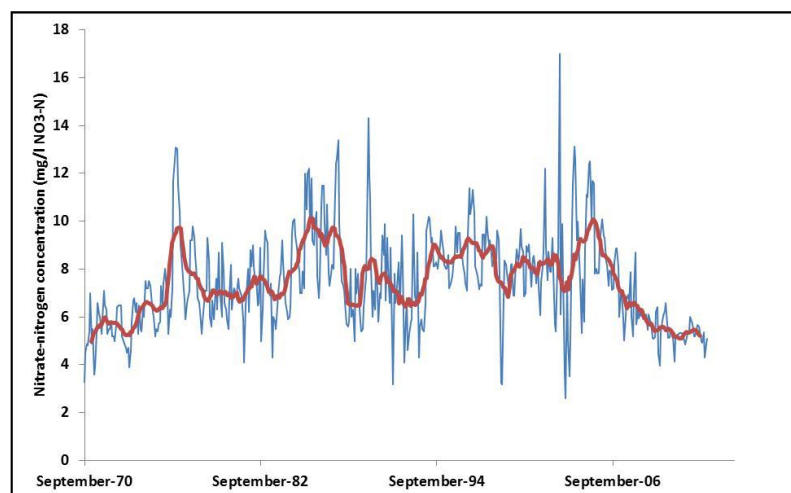
No.	Category	Suggested topic	Data available	FSC staff
1	Climate	Changes in climate since 2001	Digitally from 1960-present	Andy Pratt
2	Water quality	Analysis of data sets	Digitally from 1982 - present	Nick Binnie
3	Water quality	Field studies of spatial and temporal patterns of water quality in the Slapton Ley catchment area.	Digitally from 1982 - present	Nick Binnie
4	Limnology	The impact of nutrient enrichment on the water chemistry of the Ley	Digitally from 1982 - present	Nick Binnie
5	Vegetation	Identification and evaluation of new sites for Strapwort re-introduction in the UK.	Population from 1978 - present	Nick Binnie
6	Vegetation	Factors affecting Strapwort populations (including weather and water height).	Population from 1978 - present	Nick Binnie
7	Vegetation	A review of the France Wood, 100 year plan and the implications of Ash Dieback.	Species Lists	Debbie Gregson
8	Vegetation	The impact of changing car park locations & scenarios on the shingle ridge	Species Lists	Andy Pratt
9	Vegetation	An evaluation of the exclosures on vegetation over 35 years	Occasional data 1978 - present	Andy Pratt
10	Vegetation	Comparison of ancient woodland in Slapton Wood and plantation in France Wood using published protocols for biodiversity assessments	Species Lists	Debbie Gregson
11	Vegetation	A history of Slapton Wood.	Species Lists	Andy Pratt
12	Fish	Changes in fish populations since 2001, evaluating the impacts of the fishing moratorium.	Digitally from 1974 - 2001	Nick Binnie
13	Animals	Factors affecting Common Dormouse populations or behaviour (including weather & management).	Digitally from 2002 - present	Nick Binnie
14	Animals	Comparison of ancient woodland in Slapton Wood and plantation in France Wood using published protocols for biodiversity assessments.	Species Lists	Debbie Gregson
15	Animals	Factors affecting butterfly populations on Loworthy Fields (including weather & management).	Digitally from 2011-2013	Gemma Langworthy
16	Birds	Factors affecting Cetti's Warbler populations or behaviour (including weather & management).	Population 1996 - 2008 & maps	Nick Binnie
17	Education	Factors affecting energy and water consumption at Slapton Ley Field Centre.	Digitally 2007 - 2013	Andy Pratt
18	People	The human response to changes in NNR management.	n/a	Andy Pratt

Opportunities for Publication

Each year studies at Slapton Ley are published in a range of journals. We support publication of local studies and recommend *Geography*, *Geography Review*, *Geography in Higher Education*, *British Wildlife*, *Devon Birds*.

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