A PRELIMINARY COMPARISON OF THE SPECIES OF RYE BAY AND THE BAIE DE SOMME.

THE FIRST RESEARCH REPORT OF THE INTERREG II PROJECT

TWO BAYS, ONE ENVIRONMENT
a shared biodiversity with a common focus

Contents

INTRODUCTION

TWO BAYS, ONE ENVIRONMENT - a shared biodiversity with a common focus, is a project part-financed by the European Community European Regional Development Fund through INTERREG II in the category of 'Conservation and regeneration of the region's heritage (conservation and promotion of natural parks and the countryside).'

The English lead partner is EAST SUSSEX COUNTY COUNCIL (ESCC), but with many other partners, Environment Agency, Sussex Wildlife Trust, Farming and Wildlife Advisory Group, Royal Society for the Protection of Birds, Wetland Trust, English Nature, Friends of Rye Harbour Nature Reserve, Rye Harbour Nature Reserve Management Committee. The French lead partner is - SYNDICAT MIXTE POUR L'AMÉNAGEMENT DE LA COTE PICARDE (SMACOPI).

This first research report of the project introduces the two areas and compares their wildlife. The subsequent reports will consider other aspects of the Two Bays as follows:

- March 1999 -- will describe and quantify the existing habitats by mapping.
- August 1999 -- will reconstruct the historical habitats of the Two Bays.
- October 1999 -- will consider the potential for habitat creation and enhancement.
- December 1999 -- will consider the rare species in more detail and include Species Action Plans for some of the most important.

DESCRIPTION OF THE TWO BAYS.

See Map 1. The project encompasses areas in England and France, adjacent to, but separated by the English Channel / La Manche. The Baie de Somme (50°09'N 1°27'E) in Picardy, France, lies 90 km to the south east of Rye Bay (50°56'N 0°45'E) in East Sussex, England. Both bays have a wide variety of land use and habitats that promote a great diversity of wildlife.

Rye Bay.

See Map 2. The East Sussex project area is called Rye Bay. It occupies the river valleys and the coast around the Cinque Port town of Rye and corresponds to the East Sussex part of English Nature's 'Romney Marshes Natural Area'. The priority area is limited by the East Sussex / Kent County boundary, the extreme low water mark and the 10 metre contour line -- covering some 91 km^2.
Rye Bay can be divided into 7 sub-sites (see Map 3):

1. Rother Valley - 27.7 km long covering 19.3 km^2. The river has been embanked to reduce the frequency of flooding and there is a network of pumping stations to further manage the water table. This has allowed more intensive agriculture which has resulted in the wetland and grassland habitats declining in quality and size during the last 50 years.
2. Brede Valley - 17.5 km long covering 14.9 km^2. A similar area to the Rother, but with less intensive agriculture and a railway line running along much of its length. It has been extensively straightened, deepened and embanked to limit flooding.
3. Tillingham Valley - 9.3 km long covering 6.0 km^2. Similar, but smaller than river Brede.
4. Pett Level - covering 8.0 km^2. A low lying area, protected by a clay sea wall faced with concrete and with some pumped drainage, dominated by sheep grazing. Around the north and west margins

is the Royal Military Canal and in the south are four borrow pits created when clay was needed for the sea defences.

5. Rye Harbour - covering 10.2 km^2. An area formed by successive shingle ridges developing in a north easterly direction. On the areas between the shingle ridges agricultural land (a mix of arable and sheep grazing) now exists on what was once saltmarsh. Shingle extraction earlier this century has resulted in the creation of three major pits.
6. Camber- covering 6.7 km^2. A sand dune system has developed in the shelter of the structures that maintain the mouth of the river Rother. A large part of the dune is managed as a golf course with a variety of habitats.
7. East Guldeford - covering 26.3 km^2. An extensive low lying area dominated by sheep grazing but with six recent gravel pits and an older one, Moneypenny Pit. The network of ditches contain a good diversity of wetland flora and fauna.

Baie de Somme

See Map 4. The Baie de Somme includes the estuary of the Somme and the surrounding 'plaine maritime picarde'. It extends from the Authie river in the north to the Bresle river in the south, a distance of some 70 km. The area has developed as a result of natural and artificial processes, the latter including the sea wall and numerous ditches for drainage and defence against the sea. The rivers and dykes of the Baie de Somme have a considerable fishing and hunting interest and this is one reason why the Baie has not been industrially developed.

Baie de Somme can be divided into 4 sub-sites:

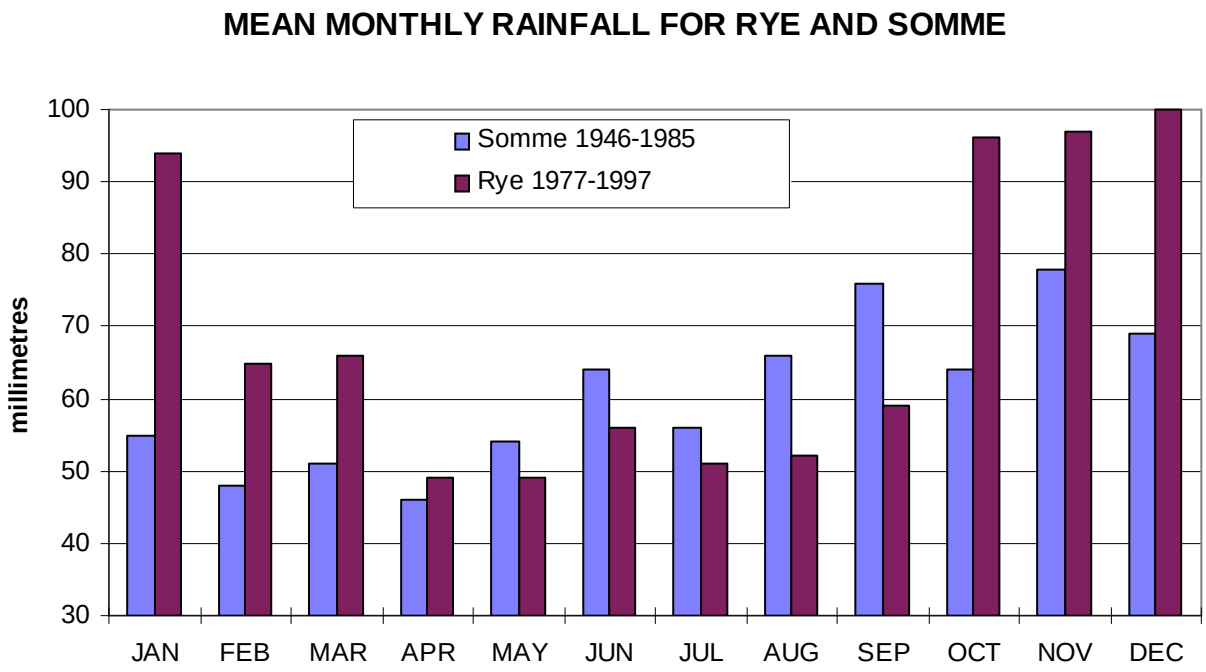
1. In the north, the low valley of Authie is a natural boundary with the Pas-de-Calais department. In the south of this low valley are 500 ha of grazed meadows or polders where hunting constitutes a secondary activity.
2. In the west, the Marquenterre is separated from the sea by sand dunes which cover more than 3,000 ha. In the Marquenterre (which is distinct from the 'Parc Ornithologique du Marquenterre'), much of the land has been drained for agriculture and traditional meadows have been replaced by arable fields.
3. In the centre, the low valley of the Somme has been reclaimed from the sea during the last two centuries. Here 1,200 ha of meadow and agricultural land are intensively studied by SMACOPI. Numerous channels of the drainage system interrupt the meadows, resulting in an abundance of wetland habitat. The other feature of this site is the existence of fresh and brackish water which ensures a high diversity of plants and invertebrates. The bocage countryside with many hedges, trees and small fields now covers a small area and is only found in Favières and Froise. Salix trees are a major feature and intensive agriculture now takes the place of meadows with livestock.
4. In the south, the lowlands of Cayeux is a large site below the level of the sea. A sea wall, created on a shingle ridge, protects the area from the sea and storms. The situation is very precarious and sometimes the sea wall breaches, resulting in flooding by saltwater. The wind, the salt transported by the wind and the lack of soil are responsible for a very particular vegetation, without trees or bushes. The poor quality of grass is responsible for a low density of cattle on the meadows. The lowlands of Cayeux are known because of the reserve du Hâble d'Ault, a large area of shingle and sand with very sparse vegetation.

CLIMATE

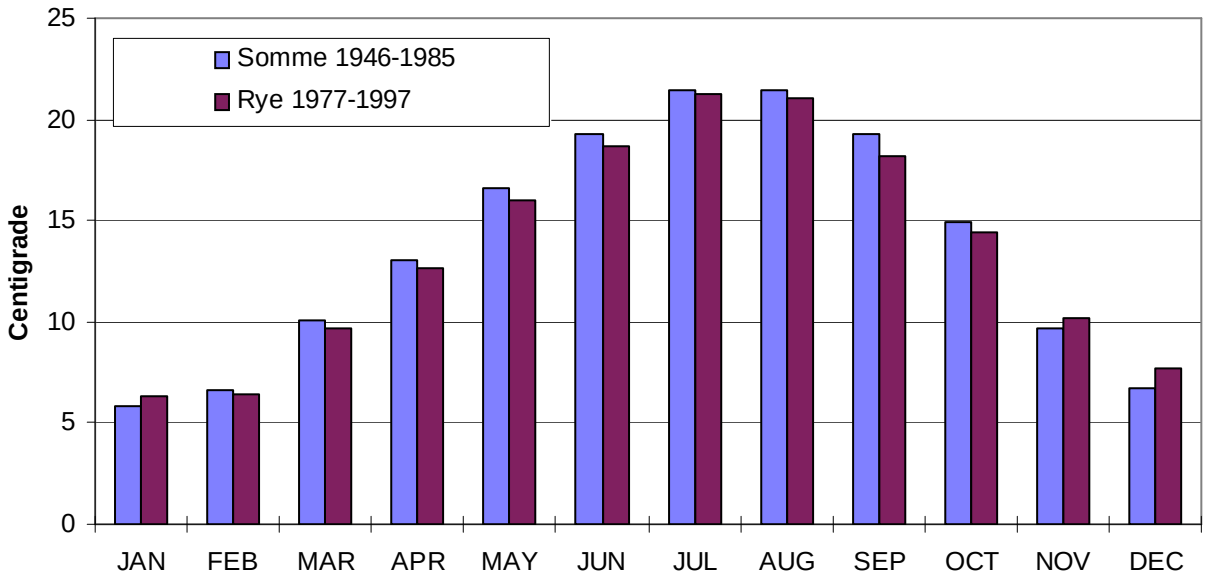
The Two Bays lie on opposite sides of the English Channel / La Manche, which is the southern extension of the North Sea. This greatly influences the climate which is generally cooler in summer and warmer in winter than most of Europe. Records of rainfall, maximum and minimum temperatures have been kept for the periods 1946-85 in the Somme and 1977-97 in Rye and these are summarised below.

The mean annual rainfall was 727 mm. in Somme and 832 mm. in Rye.
The Somme has drier winters, but wetter summers than Rye.
The temperatures are very similar, but the Somme has cooler winters and warmer summers, because of its attachment to the European continent.

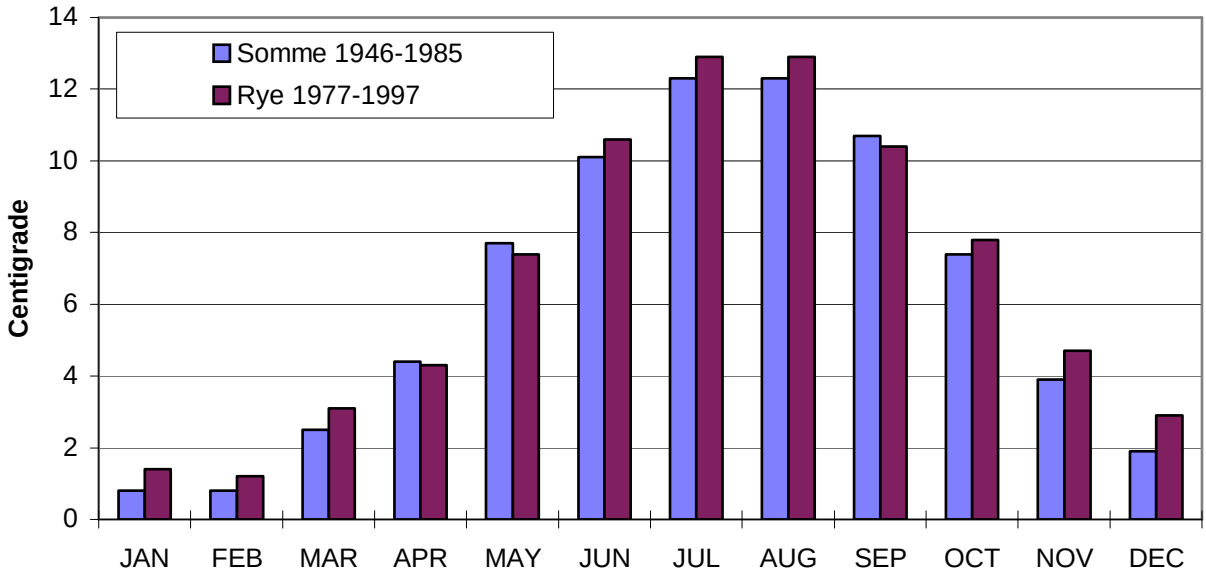
The similarity of the two climates would be expected to be reflected in similar communities of plants and animals.



MEAN MAXIMUM TEMPERATURE FOR RYE AND SOMME



MEAN MINIMUM TEMPERATURE FOR RYE AND SOMME



HABITATS

Within the Two Bays there is a great variety of habitats resulting from a combination of several important factors: a variety of soils; a gradient of salinity; degree of exposure to wind; frequency of flooding by the sea; level of the water table; and different land management practices.

The influence of the sea in the Two Bays has been greatly reduced during the last one hundred years by man-made sea defences. In addition, the naturally high water table has been lowered by a drainage system emptying into the rivers. The loss of wetland has been partly offset by the extraction of the largest shingle ridges, creating extensive areas of permanent water.

The main habitats can be broadly divided into:

Open sea

The sea is the major factor which has shaped the land in the Two Bays and it will be a major factor in the future of the wildlife. With the predicted rise in sea level, the sinking of the land and more frequent storms there may well be a return to a greater influence of the sea on the habitats of the land. Another major factor will be the policy and expenditure on coastal defence in the two countries.

Intertidal

The area between the very highest and the very lowest tides varies greatly in structure depending on the tidal currents and degree of exposure - from sand to mud to saltmarsh. This hostile environment contains a varied community of specialised wildlife. In the Baie de Somme there is a large area of saltmarsh, but in Rye Bay little remains after extensive inning and draining of the marsh.

Dunes

Where sand is blown inland from the intertidal deposits it accumulates around debris and plants to build up into massive dune structures. The bare, mobile sand is colonised by specialised plants which eventually stabilise the dune. In Rye Bay this occurs along a 2 km length of coast at Camber and in the Baie de Somme along a 12 km length at the Marquenterre.

Shingle

The combined action of storms and high tides over hundreds of years has built up new land from the flint stones derived from the coastal erosion of chalk cliffs. The young shingle ridges are poorly vegetated with pioneering lichens and flowering plants. Further inland the older ridges have a thin soil and are well vegetated with many species adapted to a short growing season. In the Two Bays there is only a small proportion of undamaged shingle ridges. Gravel exploitation is well developed in Baie de Somme, with 250 ha in Le Crotoy and 75 ha in Cayeux – le Hourdel, while in Rye Bay there are pits covering 145 ha. More superficial damage has been done by the cultivation of shingle and spreading of soil for agriculture and the disturbance of the surface by vehicles driving over the shingle.

Open Water

There is little natural open water, but extraction of shingle has created vast areas of water. The character of these pits varies considerably in salinity, nutrients, depth, wind exposure, margin

profile, islands and disturbance by man. These new waters are important for wetland wildlife and partly compensate for the loss of more natural wetlands.

Grassland

The value of grassland to wildlife is variable and dependent on such factors as, its age, the level of fertiliser and pesticide application, intensity and type of grazing, soil type and drainage. Only a small proportion of the total grassland area can be classified as unimproved and of high wildlife value.

Arable

Improvements in drainage have enabled the extensive cultivation of a range of crops. Although detrimental to much wildlife these crops can benefit some species, e.g. Grey Partridge.

Marsh

This broad habitat category ranges from emergent vegetation such as reeds and reedmace to ground that lies wet in winter and remains damp in summer. Natural succession leads to scrub and then to woodland dominated by Salix species.

Trees and scrub

Where there is little grazing the vegetation may develop into scrub dominated by bramble, gorse and hawthorn and then, after several years, to woodland dominated by Salix species.

Towns and buildings

The built up areas do have their own wildlife interest. Some buildings offer breeding and roosting sites for birds and bats and gardens may offer rich feeding resources for a variety of animals, including insects.

Road and rail

Roads may have an impact on habitats. For example, in the Baie de Somme the departmental roads D40 and D940 are built in a place where meadows and wetlands were prevalent. In Rye Bay proposals to create a by-pass on the A259 for Rye and Winchelsea encountered considerable environmental constraints and plans have been dropped. Roadside verges may, if managed sympathetically, constitute a valuable habitat.
The Paris – Boulogne railway prevents movement of water in the site called ‘marais de Rue’ and in Rye Bay the Hastings - Ashford line provides a linear habitat of scrub and marsh in the Brede Valley.

WILDLIFE DESIGNATIONS

The Two Bays have several levels of statutory and other protection for their wildlife including national and international designations.

NATIONAL DESIGNATIONS

Site of Special Scientific Interest (SSSI)
SSSIs are declared by English Nature for their special wildlife (or geological) interest. They have some statutory protection under the Wildlife and Countryside Act 1981. Some SSSI also have the international designations described below.

Zone d'importance communautaire pour les Oiseaux (ZICO)
A ZICO is an important area for bird conservation in Europe. It is based on an inventory of areas which have an importance in the sense of the directive 79 / 409. With this inventory, it is possible to designate Special Protection Zones.

INTERNATIONAL DESIGNATIONS

Ramsar sites
The convention on 'Wetlands of International Importance especially as Waterfowl Habitat' was adopted at a meeting of countries concerned with wetland and waterfowl conservation which was held at Ramsar, Iran in 1971. The objectives are to stem the progressive encroachment on, and loss of, wetlands now and in the future. A wetland is defined as being an area of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh brackish or salt. This includes areas of marine water the depth of which at low tide does not exceed 6 metres. The UK Government signed the Convention in 1973 and ratified it in 1976 (Command 6465).

Special Protection Areas (SPA) (or in France, Special Protection Zone ZPS).
As a member of the European Union, the British Government is bound by the European Communities Council Directive of April 1979 on the Conservation of Wild Birds, the "Birds Directive" (79/409/EC). Member states are required to take special measures to conserve the habitat of two categories of birds. These categories are (under Article 4.1 of the Directive) certain listed rare or vulnerable species, and (under Article 4.2) regularly occurring migratory species. Particular attention must be paid to the protection of wetlands, especially wetlands of international importance.

Special Area of Conservation (SAC)
The other European designation relates to the "Directive on the conservation of natural habitats and of wild fauna and flora" (92/43/EEC), usually called the "Habitats Directive". This will "...maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest."
A Community-wide network of protected areas will be set up, to be named "Natura 2000". The first step will be identifying Sites of Community Importance (SCIs). These will be subsequently designated by Member States as Special Areas of Conservation (SACs). The Birds Directive established the concept of Special Protection Areas (SPAs) for birds and these sites will be included as will SACs in the Natura 2000 network.

Wildlife Designations in Rye Bay

1. Eight SSSIs with 28.4 km^2. in the Rye Bay area; all of - Rye Harbour SSSI, Pett Level SSSI, Camber and Rother Saltings SSSI, Winchelsea Cutting and Houghton Green Cliff SSSI, and part of - Walland Marsh SSSI, Dungeness SSSI and Hastings Cliff - Pett Beach SSSI. See Map 5.
2. Candidate SPA: Dungeness to Pett Level site 1209A (part in Rye Bay)
3. Candidate Ramsar wetland site: Dungeness to Pett Level site 1209A (part in Rye Bay)
4. Potential SAC: Dungeness (part in Rye Bay)
5. Important Bird Area (IBA): Dungeness to Pett Level site 204 (part in Rye Bay)
6. Five Sites of Nature Conservation Importance (SNCI): Brede Valley, Mountsfield, Camber Sands, Dogs Hill Road, Pett Levels all designated in 1997.
7. A Local Nature Reserve: Rye Harbour established in 1970.
8. Two Sussex Wildlife Trust Reserves: Pett Pools and Castle Water established 1992.
9. Wetland Trust reserve: Pannel Valley established in 1986.
10. Three farms owned by the National Trust: Wickham Manor, Crutches Farm and Marsham Farm.

Wildlife Designations in Baie de Somme

1. The first maritime reserve was created in 1968, and is well established now as the Natural Reserve of Baie de Somme.
2. The other main reserve is Hâble d'Ault, in the south of Cayeux.
3. A maritime reserve is situated on the north side of the Natural Reserve between Baie d'Authie and Baie de Somme.
4. A less well known reserve was established at the beginning of the seventies in the cliffs in the south of the Baie de Somme site.
5. a fifth reserve was created in 1998, near Fort-Mahon, in the artificial basin of a sugar refinery.
6. Two ZICO sites have been created covering 225 km^2: the first one deals with Baie de Somme (sensu stricto) and Baie d'Authie. The second ZICO is "marais arrière-littoraux picards", is wetland around Rue. See Map 6.
7. An SPA: the sub-site Baie de Somme (except Parc Ornithologique du Marquenterre).
8. The Ramsar designation of Baie de Somme became official on 2nd February 1998. The site, 182 km^2, covers almost the same area as the two ZICOs.

A COMPARISON OF SPECIES

On each side of the Channel, naturalists have produced inventories of plants and animals. In Baie de Somme, surveys have been conducted by people in an ad hoc way, so there are many taxa that have not been studied, especially among the invertebrates,. In Rye Bay, wildlife surveys have been encouraged by English Nature, the Sussex Wildlife Trust and the Rye Harbour Nature Reserve and many specialists have been encouraged to visit the area. The Rye Bay records are kept on the wildlife database RECORDER and it is hoped that this software can be adapted for use in France.

There are lists of recorded species of the Two Bays in the attached Excel (version 7.0) spreadsheet called TWO BAYS SPECIES.xls. This contains 4617 rows so it has not been printed in full - just the first page of the plants and invertebrates and all of the birds.

Each species is a ROW in the spreadsheet with COLUMNS of;

Family name, Scientific name, English name, French name,

Somme presence, Rye presence, Shared presence, Combined presence, British status.

For flowering plants there is also the French Status and for birds there are additional columns for breeding species.

The comparison between the species of the Two Bays is made difficult by the difference in the efforts made in the different groups and sites. However, for some groups of species there has been sufficient recording to allow a good comparison which are summarised in the charts below.

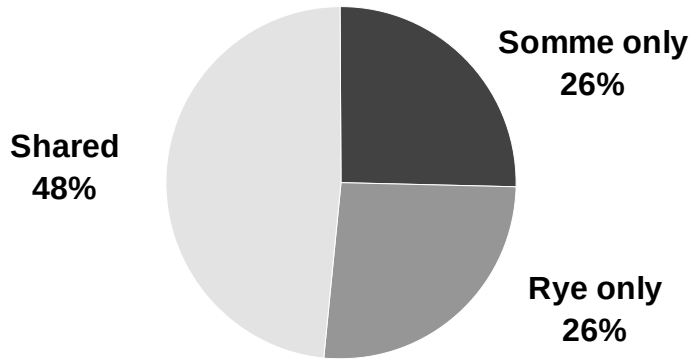
WILDLIFE GROUPS		TOTAL	SOMME ONLY	RYE ONLY	SHARED
ALL PLANTS		**1071 species**	**245**	**348**	**478**
Lichens		132 species	5	106	21
Horsetails		3 species	0	0	3
Ferns		17 species	5	5	7
Flowering Plants		919 species	235	237	447
Cabbage family		38 species	4	17	17
Pea family		51 species	6	23	22
Daisy family		91 species	21	23	47
Umbellifer family		39 species	5	13	21
Figwort family		31 species	10	11	10
Sedges		52 species	29	6	17
Grasses		84 species	16	17	51
ALL INVERTEBRATES		**3172 species**	**281**	**2396**	**495**
Spiders		168 species	19	121	28
Beetles		688 species	73	502	113
Dragonflies & damselflies		38 species	14	10	14
Butterflies & moths		757 species	53	431	273
Snails & slugs		87 species	32	30	25
Bugs		205 species	3	196	6
Bees, wasps & ants		148 species	10	132	6
ALL VERTEBRATES		**374 species**	**18**	**54**	**302**
Birds		298 species	0	24	274
Breeding Birds		139 species	30	12	97
Mammals		45 species	11	14	20
Amphibians		12 species	6	1	5
Reptiles		4 species	1	0	3
Fish		15 species	0	15	0
ALL SPECIES		**4617 species**	**544**	**2798**	**1275**
Rye species		4073 species	-	2798	1275
Somme species		1819 species	544	-	1275

DISCUSSION

At this early stage of the project it is interesting to recognise the great similarities that exist in the locations, the climates and the habitats of the Two Bays, in contrast to some clear differences that exist in their wildlife.

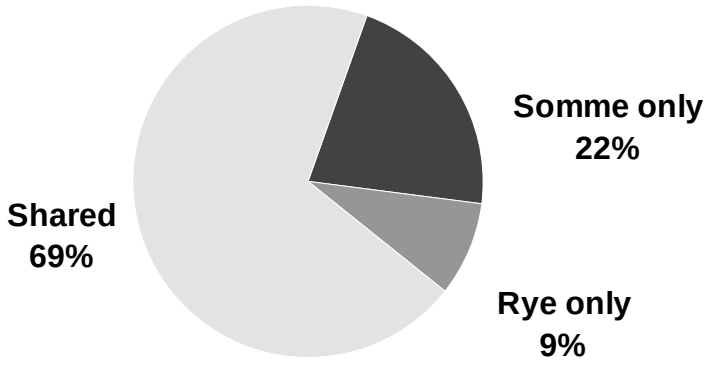
Four groups of species are considered to be well known in both bays:

Flowering Plants - 919 species



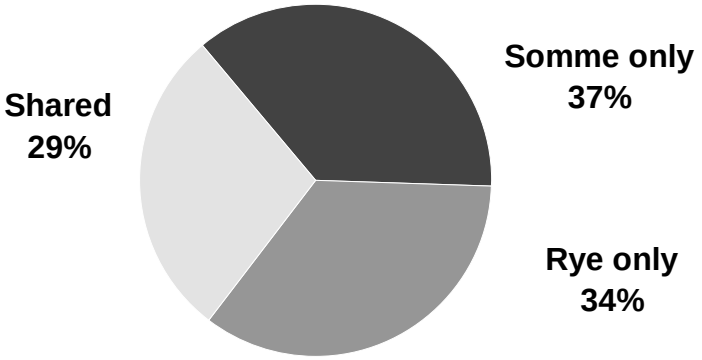
The history of the flora of Sussex has been reviewed by Smith and Howard (1996 - A History of Sussex Wild Flowers, Booth Museum, Brighton). The impoverished flora of the last glacial period (more than 10,000 years ago) has become more varied by natural dispersal and the significant deliberate and unintentional introduction by man. The similarity of the species of the Two Bays (48% shared) is, therefore, not unexpected when this considerable role of man is taken into account.

Breeding Birds 139 species



The differences are small and it can be said that the breeding bird community is similar on each side of the Channel. This is probably due to the great mobility of birds. Of the 139 species recorded as breeding, the 'special' Rye species are Sandwich, Common and Little Terns, while the Somme has Black-necked Grebe, Pintail, Marsh and Hen Harrier, Buzzard, Spotted Crake, Black-winged Stilt, Kentish Plover, Long-eared Owl, Bluethroat, Redstart, Black Redstart, Whinchat, Great Reed, Icterine, Melodious and Wood Warblers, Firecrest, Golden Oriole, Great Grey Shrike and Serin. Further work will aim to estimate the breeding population of each species and the regularity of breeding.

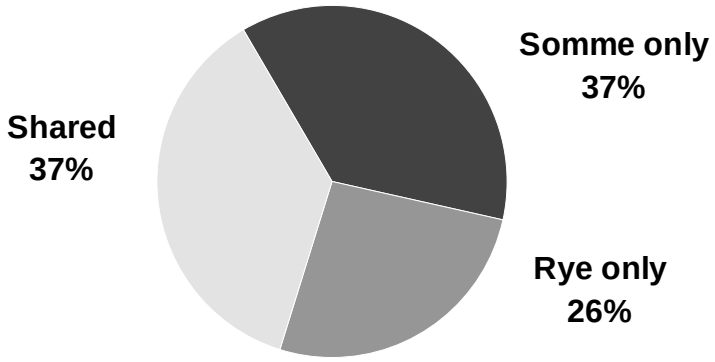
Mollusca - 87 species



For Molluscs there is a 'trend of thirds', such that one third of the total species are common to both bays, one third is 'special' to one bay and one third 'special' to the other. Of the 14 recorded species

of Ramshorn snail, Planorbidae, only *Planorbis carinatus* is common to the Two Bays. All of the eight pond snails, Limnaeidae, occur in the Somme, but only four in Rye. Of the three British Red Data Book species at Rye, none have been recorded at the Somme.

Odonata - 38 species



There is also the 'trend of thirds' for dragonflies and damselflies. The only British Red Data Book Odonata species in Rye Bay, Scarce Emerald Damselfly, has not been seen there for 50 years and it has not been recorded at the Baie de Somme. However, the three British notable species, Hairy Dragonfly, Ruddy Darter and Variable Damselfly, have all been recorded in the Somme. Several fairly common species occurring at Rye, such as Brown Hawker, Broad-bodied Chaser, Four-spotted Chaser, Beautiful Demoiselle and Banded Demoiselle, have not yet been recorded in the Somme. This is unexpected considering the great mobility of these invertebrates.

WHY ARE THE SPECIES LISTS DIFFERENT?

There are several possible reasons why the species lists are different:

- Not all taxa have received the same intensity of study, for example, most insects are not well studied in the Baie de Somme, which may explain most of these differences. With further study many of these apparent distinctions may be resolved or explained. In the groups that are considered to be well studied the proportion of 'shared' species is greater i.e. 69% of breeding birds, 48% of flowering plants, 37 % of Odonata and 29% of molluscs.

- There is probably a phenomenon of insularity which plays a role in the distribution of the species with limited mobility. England and France have been separated by sea for about 8,000 years, with the shortest distance now being 31 km between the closest points.

- The climate of the Two Bays, although similar, may be sufficiently different to influence some species, especially if they are on the edge of their distribution.

- The management of the land by man, for example, the control of predators and vermin, the water table management, or whether the agriculture is extensive or intensive, will be important for many species.

- Even if the habitats of the Two Bays appear similar, there will be subtle differences in micro-habitats which may explain the presence or absence of some species. The quantity and quality of the habitat, both now and historically, may be an important factor in the persistence of some species.

- Some invertebrates are dependent on a single species of plant for all or part of their life cycle, so if the plant is absent, the invertebrate cannot occur.

The future work of this project will define more precisely the species and habitats of the Two Bays and give the opportunity to investigate factors that could explain the differences. The work will include:

- further recording of species to fill the gaps demonstrated in this report.
- recording, mapping and quantifying the existing habitats.
- estimating the previous extent of habitats.
- determining which of the thousands of species are good indicators of habitat quality and which are considered rare or endangered.
- recording the distribution of the indicator, rare and endangered species (both within and between the Two Bays).
- determining the requirements of these species and whether any positive management is possible.
- considering the potential for habitat creation and enhancement.

From this project we will be in a considerably better position to know what it is that makes the wildlife of Two Bays so special. The project will also disseminate this information to many of the people and organisations that have an interest or impact on our countryside. We then hope that it will be possible to make significant steps towards safeguarding and enhancing its future.