

# Pembrokeshire Fact Sheets



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**This Pack contains 20 fact sheets covering:-**

**Coastal Birds - Big Ones**  
**Coastal Birds - Small Brown Ones**  
**Seabirds**  
**Whales, Dolphins and Porpoises**  
**Atlantic Grey Seal**  
**Coast Path Animals**  
**Flowers of the Coast Path**  
**Geology of North Pembrokeshire**  
**Geology of South Pembrokeshire**  
**Rocky Shores**  
**Out at Sea**

**These fact sheets have been developed for use by members of the Pembrokeshire Marine Code Group and Pembrokeshire Outdoor Charter Group. They are not intended to act as identification guide. They aim to provide interesting information to the users and activity participants which will raise awareness of how diverse Pembrokeshire's coastal habitats are.**

**Operating within the sensitive environments as we do, we all have a responsibility to the environments and wildlife of Pembrokeshire, to ensure that activities are appropriate and sustainable. Raising awareness of the habitats and animals will give added value and highlighting the codes of conduct developed by the providers themselves will help to preserve what we already have for the future.**

**Thanks go out to all those involved in the development and production of these fact sheets.**

## COASTAL BIRDS - BIG ONES

### **Peregrine Falcon** L= *Falco peregrinus* W= *Hebog tramor*

**WHATS IN A NAME?** - means wandering falcon, after its habit of wandering anywhere for food after the breeding season

**MAX LIFESPAN** - 18 years

**FOOD** - anything from a Goldcrest to a Heron BUT, Pigeons are favoured 50% are caught on the upwards swoop from a dive.

**SQUATTER** - nests in an earth scrape on a cliff or in someone else's Nest.

#### **DID YOU KNOW?**

**FASTEST MOVING BIRD IN THE WORLD** reaching speeds of around 180kph (112mph) when stooping [diving] after prey.

**BAFFLES ON NOSTRILS** help it breath whilst diving.

**BIRD of KINGS** King Henry VIII saw the peregrine here in Pembrokeshire and demanded to have one. It was protected by Royal decree, so only kings and nobles used them for falconry.

**RUNWAY CLEARANCE** since the war, trained peregrines have been used at many military airbases to clear runways of birds and city buildings of pigeons.



### **Buzzard** L= *Buteo buteo* W= *Bwncath*

**WHATS IN A NAME?** - Buzzard comes from French 'busard' meaning 'Stupid' as birds were considered worthless by falconers.

**MAX LIFESPAN** - 25 years

**MONOGAMOUS** - pairs tend to stay together for life.

#### **DID YOU KNOW?**

**NESTING** female stays on nest for first 2 weeks & is fed by the male, they then share hunting & both feed chicks. Juvenile birds remain with parents for several months after fledging (July-August) learning how to catch food.

**GOOD MUMS** - falconers use female buzzards to incubate eggs and bring up chicks of other falcon as they are such good mothers.

**COMMONEST** bird of prey in UK.

**A WAKE** is the collective name for a group of Buzzards.



### **Kestrel** L=*Falco tinnunculus* [from *tinnio* meaning to scream] W=*Cudyll coch* - red falcon

**MAX LIFESPAN** - 15 years

**FOOD**- hover & plunge diving to catch mice and voles. When food is short they do not breed.

#### **DID YOU KNOW?**

**NESTING**- birds are site faithful and often use old Raven and Buzzard nests. Eggs May, hatch early June, fledge July.

**WIND FOCKER** - Old English for a bird that penetrates the air or hovers.



**NO AGGRESSION** between chicks; the female stays near the nest all the time and the male supplies the food (mice, voles).

**WHOLE FAMILY** - fed by parents and roost back at the old nest.

**LOW CHICK SURVIVAL** - only 20% chicks survive to second year.

**HOME LOVERS** - all birds stay local or near breeding area unless food supply drops.

**THREATS** - kestrels, like all birds of prey suffered badly in 1950's from pesticide pollution. DDT/Dieldrin affected the calcium content of eggs making the shells wafer thin.

### **Oystercatcher** L= *Haematopus ostralegus* W= *Pioden y mor*, [meaning sea magpie]

**ADULT COLOURS**- The 'oyk' adult has a long, orange-red bill and reddish-pink legs; fledged young have a black tip to their bills and their legs are dull coloured.

**BREED**- in Pembrokeshire. Adults return to same breeding and feeding grounds each year.

#### **DID YOU KNOW?**

**LONG LIVED** - a 29 YEAR OLD ringed as a chick on Skomer has regularly returned back to Angle Bay each year.



### **Raven** L= *Corvus corax* W= *Cgfran*

**MAX LIFESPAN** - 16 years

**WINGSPAN** - 150cm **weight** - nearly 3 lbs (1.5Kg bag of sugar).

#### **DID YOU KNOW?**

**LARGEST CROW** - all black with a large black bill, and long fingered wings and will beat up Buzzards & win.

**A DREAD OF RAVENS** is the collective name.

**TOWER OF LONDON** was replenished with young Pembrokeshire ravens from sites near Fishguard like Goodwick Moor and Strumble Head. Legend has it that Ravens must never leave the Tower, or England will fall to the enemy.



### **Chough** L= *Pyrrhocorax pyrrhocorax* W=*Bran goesgoch* [Welsh name means red-legged crow The latin means flame coloured raven].

**MAX LIFESPAN**-16 years

**FOOD** - soil grubs & crane fly larvae. Look out for holes where choughs have been poking their beaks into the soil.

#### **DID YOU KNOW?**

**RARE** - in 2004 approximately 342 breeding pairs in UK  $\frac{3}{4}$  in Wales

**FIRE RAISER & THIEF** it was killed for thieving and hiding money (up until 1830s) and a belief it started fires in Cornwall because of its red bill & feet.

**KING ARTHUR** in Celtic myth was believed to have returned as a Chough after his death and the red beak and legs were to signify the blood of his battles.

**A BECKIT** is the name given to the image of a Chough appearing on a coat of arms. Thomas a Beckett (Archbishop of Canterbury 1163) had three on his coat of arms hence the name.



## COASTAL BIRDS - Small brown ones

**Starling** L= *Sturnus vulgaris* W= Drudwen

**MAX LIFESPAN** -22 years

**NESTING** in ivy and holes in walls, can produce up to 4 broods a year.

**DID YOU KNOW?**

**MIMICS** starlings can copy the sounds of croaking frogs, birds, car alarms and even ringing telephones.

**PLUMSTONE MOUNTAIN** near Camrose is a winter roost for 1000's of birds from UK, Russia and Europe.

**BEAKS TELL ALL** a yellow beak shows the bird is in breeding condition. Males have a blue base to their beaks and females have a pink base.

**COMMON BUT DECLINING** they are the commonest bird at the table but are on the UK and Wales threatened breeding bird list.



**Meadow pipit** L = *Anthus pratensis* W= Hedydd y waun

**MAX LIFESPAN** - 7 years

**DID YOU KNOW?**

**FOSTER PARENTS** - Meadow Pipit parents can be used by cuckoos to bring up their babies.

**REGULAR ROOSTS** - In winter the birds go back to the same night time roosts every year.



**Rock pipit** L= *Anthus petrosus* W= Hedydd y graig

**MAX LIFESPAN** - 7 years

**DARK LEGGED COUSIN** of the meadow pipit.

**WEIGHT** - same as Meadow Pipit at 20 - 30g.

**BREEDS** around the coast and on the islands and stays in winter time.



**Stonechat** L= *Saxicola torquata*

**MAX LIFESPAN** - 6 years

**DID YOU KNOW?**

**BANGING STONES** together makes the same sound as the stonechat call.

**WINTER BREAK** - just like us, some stay in the best nesting areas while others move south to Iberia or Northern Africa.



**Whitethroat** L= *Sylvia communis* W= Llwydfron

**LIFESPAN** - up to 8 years

**NESTING** in scrub and bushes close to open areas.

**DID YOU KNOW?**

**SUMMER VISITORS** breeding here and spending the winter in Africa.



**Dunnock** L= *Prunella modularis* W= Llwyd y gwrych

**MAX LIFESPAN** - 9 years

**DID YOU KNOW?**

**STEP PARENTS** for cuckoos. The 'parent' dunnock is much smaller than the cuckoo so they have to stand on the young cuckoos back to feed it.

**POPULATION BOOM** in winter as approx 10-15 million birds arrive from northern Europe and Scandinavia in September.

**POSSESSIVE MALES** will guard female partner. If he comes back from hunting and suspects her of being mated by another male he will peck at her cloaca (a chamber inside the female) and remove the foreigners sperm package. But...

**DEVIIOUS FEMALES** will mate with numerous different males but still keep her partner!  
**15<sup>TH</sup> CENTURY** meaning of 'dunnock' is 'small brown bird'.



**Skylark** L= *Alauda arvensis* W= Ehedydd

**MAX LIFESPAN** - 8 years

**NESTING** in hollows on the ground, lined by the female with leaves, grasses and hair.

**BROOD** - 3 in good conditions with 37 days from laying eggs to independent fledglings (babies that can fly).

**DID YOU KNOW?**

**RAPID WING BEATS** help males to do vertical take-offs flying straight up to 1,000 feet above their nest site - they sing non-stop for an hour or more.

**CRESTS ON THEIR HEADS** - shows that they are excited, angry or alarmed.

**INTENSIVE FARMING** is threatening success. Areas of National Trust grassland habitat at Marloes are being actively managed to create good breeding sites.

**MEAT EATERS** - the chicks are entirely insect eaters for the first 10 days of life and then they start eating their 'greens' - seeds and grasses.



**Wren** L= *Troglodytes troglodytes* W= Dryw [latin means cave dweller]

**NESTING** in woodland, hedges, coastal cliffs and crevices.

**DID YOU KNOW?**

**SECOND SMALLEST** bird breeding in Britain (9g weight of a wine cork & 13 cm wingspan).

**WINTER ROOSTS** of more than 60 birds snuggled up for warmth have been recorded.

**LOUD WARBLE** for its size. Wrens are very vocal and have been known to have **regional dialect** to their songs.



## SEA BIRDS

### **Puffin** L = *Fratercula arctica* W = Pal

**WHAT'S IN A NAME?** Latin name means brother or priest, this may have something to do with how Puffins take off and the way they hold their feet together as if in prayer. **Other names** sea parrot or sea clown

**NO FUSS** - When chicks leave the nest, they go at night, alone, with no practise flight and swim out to sea. They don't come back for 3 years.

**LONG LIVE THE PUFFIN** - longest lived = 25 years.

**THEIR WINTER IS AUGUST TO MARCH** - No one knows where they go out of the breeding season exactly but they are somewhere out in the Atlantic Ocean.

**FAT PORKERS** - They swim 30 metres under water and hold their breath for 30 seconds to catch sand eels - their main food. Stubby wings are great for swimming but still have to be slightly tucked in, feet act as rudders. Their upper beak and tongue are toothed and have been known to hold in excess of 100 fish (but usually 10)!

**FLIRTY, NOT DIRTY** - orange legs, black & white tux and multi-coloured lipstick & eyeliner is their pulling gear for attracting mates. Flying from their ledge with slow wing beats and feet touching means "I LOVE YOU".

**YAWNING WARNING** - a puffin out to cause trouble with the opposition yawns at opponents.

**EN SUITE LOOS**- loos are dug next to the nest chamber.

#### **THREATS**

eggs and small chicks too close to the surface get grabbed by Jackdaws or Gulls

Gulls nick their beakfuls of food

Large scale threat from pollution. The Torrey Canyon Oil Spill (1967 in Cornwall)

killed 85% of the our population and the Sea Empress(1996) had more local impacts

Low reproduction rate so it takes decades for numbers to recover

**PADDLING AT SEA** - when you get close they look at you above and below the water just in case you are going to attack from below.



### **Guillemot** L = *Uria aalge* W = Gwylog

**WHAT'S IN A NAME?** Guillemot - from the French Christian name for William, hence **local names** like willy or willock.

**SEABIRD CITIES** - Guillemots look like French gentlemen in a pissoir - **if they turn round to look at you and bob their heads, you are too close.**

**SAFETY IN NUMBERS** - a crowd is safe, experienced birds breed in the middle of a group, the edges of the colony are less safe. Monogamy pays. 1<sup>st</sup> breeds 4 yrs.

**EGGS-TREME NESTING** - They occupy the smallest breeding territory in the bird kingdom - **where they stand.** With the single egg balanced on top of the feet there's little fighting between neighbours, it's too risky for the egg. Mates exchange the egg from feet to feet.



**GUILLEMOT CONTINUED:**

**A LIFE ON THE BRINEY**- First eggs are in early May, hatch early June. The chicks jump off the ledge three weeks later. They are a small mouthful for a gull, just a ball of fluff with enough flight feathers to glide to the sea where Dad is waiting to swim away from the island & danger.

**SEX ON THE EDGE OF A LEDGE** - Mums are left on the ledges to claim that successful spot for the next year and this is when young males visiting a colony for the 1<sup>st</sup> time get to mate with a more experienced woman!

**Razorbill** L = *Alca torda* W = *Llurs*

**WHAT'S IN A NAME?** Both latin names come from Swedish - alka meaning auk (the family name for razorbills, guillemots & puffins) and torda from the Swedish name for razorbill in the Gottland province where its called a 'tordmule'.

**38 YEARS** is the oldest recorded age.

**FAITHFUL** to its mate at the nest site but...on the

**LOAFING ROCKS** - Off duty from nesting, razorbill parents get to relax, socialise and some go further than that mating with any female and sometimes having a go at males too!

**LEAP OF FAITH** - Chicks fledge when they are one third the size of the adult with their Dads; Mum remains at the nest site claiming it for the next year.

**COLOUR IN BLACK & WHITE** - razorbills have a bright Yellow gape.

**REGGIE THE RAZORBILL** - is Pembrokeshire Coast National Park Authority's emblem.

**BIG EATERS** - Chicks have about 5 meals - more than half their weight! Adults can eat 25% of their body weight every day!

**FLIGHT SPEED** - 86 kph

**WINTER BREAK:** Stay near colonies & visit on calm days.

**THREATS** - oil spills in inshore waters such as the Sea Empress.



**SHAG** L = *Phalacrocorax aristotelis* W = *Mulfran*

**WHAT'S IN A NAME?** Phalacro - bald: corax - crow and aristotelis - after Aristotle. The shag is from its shaggy crest.

**DARK GREEN** -feathers and its breeding crest identify the Shag. It is also usually smaller and slimmer than the black Cormorant.

**HOMEMAKERS:** Nest site is usually in a hole or under a sheltered under hang, the nest is a bundle of sticks and vegetation. They usually stay within 150 Kms of their breeding grounds all year.

**PROJECTILE POOL!** Excellent co-ordination of the bowels.

**DIVERS** - they have a characteristic **jump up and dive**, and can swim underwater for several minutes, often fish in deep sea eg Jack sound.

**LONG NECKS** - chicks retrieve their dinners by putting their heads inside their parents mouths and gulping down a soup of semi-digested fish.



## SEA BIRDS

**Cormorant** L = *Phalacrocorax carbo* W = *Mulfran*

**WHAT'S IN A NAME?** Charcoal (carbo) coloured sea crow.

**PERSECUTED** as they are so good at fishing they were disliked by fishermen and fish farms and killed regularly.

**INSHORE FOOD** - fish in shallower waters and up estuaries.

**CHILLY TUMMY** - the drying wings position is supposed to be warming the body up to help digest cold fish that it has just caught.

**HIGH SPEED HEAVY WEIGHT** - they've been clocked at a speed of 60 kph.

**RIGHT ROYAL** - In the 16th century James I kept cormorants on the Thames which were trained to catch fish.

**WINTER BREAK** - on UK reservoirs or Spain and Portugal.

**FLASHERS** - in April males start making the nest & advertise to potential mates by flashing their white thigh patches several times a second.



**Fulmar Petrel** L = *Fulmarus glacialis* W = *Aderyn Drycin y Craig*

**WHAT'S IN A NAME?** Fulmar = Foul gull in Norse. *Glacialis* refers to the fulmars stronghold in the cold north where it breeds in huge numbers.

**NORTHERN** version of an Albatross, Fulmars were rare birds in the 1950's.

**FOUL FOOD** - feeds on sea surface often in flocks, scavenges and eats bodies, the tube on the nose is good for smelling rotting flesh from miles away.

**PROJECTILE VOMITING** - nest site defence is by regurgitate a really foul smelling oil at the intruder which is very waterproof and difficult to remove from fur or feathers.

**AGE RECORD** - 50 years plus and still breeding

**SLOW STARTERS** - 1<sup>st</sup> breeds 8 years. They only have one chick a year which hatches in June. fledges September, [over a hundred days between laying and leaving the nest]

**WINGSPAN** - over a metre of gliding power carrying a Kg of bird

**NOVEMBER NEW KIT** - the birds leave nest sites for 3 weeks to feed and moult

**THREATS** - 5 fulmars are dying every minute in the northern seas. They are being caught on the hooks of long lines which are baited with food. The fulmars get hooked as they swallow the food and are then dragged to a watery death.



**Lesser black-backed gull** L = *Larus fuscus* W = *Gwylan Gefnddu Leiaf*

**WHAT'S IN A NAME?** *Larus* means 'waterbird,' *Fuscus* refers to its 'dark back'.

**SKOMER** has the largest colony in Europe.

**CRISIS** - numbers have been falsely increased by man chucking back dead fish from catching scampi off the coast of Pembrokeshire in the



**LESSER BLACK BACKED CONTINUED:**

1970's. This fishery is not there now and all the gulls have mostly gone back to feeding on the fields swapping fish for earthworms, beetles other small animals and your diet is instantly slimming. Some adult males are so undernourished that they are not even forming enough sperm to fertilise the eggs!

**WASTE NOT WANT NOT** - if neighbouring chicks die, adult gulls will pick them up and feed them to their own chicks. Adult gulls will also scavenge food from behind the plough or grab the slow worms, voles or mice that scamper away from the harvester..

**BULLY** - This gull bullies puffins into dropping their beakfuls of food and then gobbles them up instead of going out looking for food themselves.

**Greater Black-backed gull** L = *Larus marinus* W = *Gwynlan Gefnddu Mwyaf*

**WHAT'S IN A NAME?** Marinus - they live by the sea!

**THUG** - A large and powerful bird weighing up to 2 kg. It has a strong beak, and this gull can beat a buzzard up and win! A big male can swallow a puffin whole!

**EARLY BIRD** - Its the earliest nesting gull producing chicks that hatch in time for the feast on other seabirds eggs and young chicks as well as baby bunnies.

**MAXIMUM LIFESPAN** -23 years

**WINGSPAN:** stretch out your arms - that's how big a big great black backed gulls wings are outstretched [165cm].

**SHOOT 'EM** - Wardens on the islands used to control their numbers with a gun.

**AIRY NOSTRILS** - Like all gulls they have a hole right through the beak.



**Kittiwake** L = *Rissa tridactyla* W = *Gwynlan Goesddu*

**WHATS IN A NAME?** - Kittiwake is onomatopaeic i.e. imitates their call. Rissa is a corruption of rita which is Icelandic for kittiwake and 'tri' = three; 'dactyla' = toes, the fourth is tiny and at the back of the leg. **Local names** - Anni-gull: Black-legged kittiwake.

**INK DIPPED** - the wing tips are completely black.

**SEAGULLS** - they spend all winter at sea out in the Atlantic.

**MUD-MINERS** - this is the only cliff nesting seabird that makes a proper nest out of droppings, saliva and mud. They carry beakfuls of mud from pond edges or soft stream banks.

**NOT THRIVING** - breeding success is rarely more than 1 chick out of 3 eggs - Numbers are declining in some areas, perhaps due to a shortage of food?

**HANGERS ON** - by August fulmars and kittiwakes are the only cliff nesting seabirds left.

The newly fledged young have new flight suits which are labelled on the back with a W pattern in black.

**MAX. LIFESPAN** - 28 years



## SEA BIRDS

**Herring gull** L = *Larus argentatus* W = *Ceffn y Penwyg*

**WHAT'S IN A NAME?** "The herring eating gull"-herrings actually only form a small part of their diet. 'Argentatus' - the silver coloured gull in reference to the adults' silver grey back.

**WARNING** - numbers dropped by 85% in the 70's in many areas of the UK due to Botulism from scavenging rotten food at rubbish dumps.

**BOYS IN PINK!** - both sexes have pink legs, all gulls have a red spot under their bill that the chicks peck at as a hint to 'feed me now' .

**MULTIPLE BIRTHS** - the 3 eggs hatch in late May/June slightly earlier than lesser's

**SCAVENGE & PICK** - some adults feed on creatures they find on the seashore, at fish docks and on tidelines.

**CHEEKY OR BRAVE** - They are known to snatch chips and snacks from your hand.

**MAXIMUM LIFESPAN** - 31 years



**Gannet** L = *Morhus bassanus* W = *Gwydd Lygadlon* [clear-eyed goose]

**WHATS IN A NAME?** - bassanus because of links with the Bass Rock near Edinburgh. **Local name** 'Saethwr' means arrow.

**GRASSHOLM** second largest single rock gannetry in the Atlantic, 35000 breeding pairs plus chicks & non-breeders total = 100,000 birds.

**LARGEST** breeding seabird in the UK.

**MAX. LIFESPAN** - mid twenties as some of their fishing-diving is so risky.

**DIVE CHAMPIONS** - Gannets can plunge from 100 feet in the air into the sea at 60 mph to catch their food.

**PORPOISE LINK** - they feed on the same food so can be seen regularly in the sounds between the mainland and islands.

**HOW DO THEY DO THAT?** - adaptations to diving are:

Closed nostrils [if they were like the gulls they would blow their brains out!].

Shatter proof membrane that protects the eyes at speed and under pressure.

They can see well in water and air.

Cushioning adaptations in their neck and shoulders to absorb the shock of plunging into water at speed.

Strong grasping beak and lightning reflexes.

Body pointed at both ends.

**SEXY TOES** - males are slightly larger and have yellow weblines on their feet whereas the females have green blue lines.

**GORGEOUS GOLD** - golden tipped feathers on the head, the males colour stays longer in the breeding season than the females.

**LOOK NO BROOD PATCH!** - gannets incubate their eggs under the webs of their feet.

**CHICK DEATHS** - inexperienced breeders sometimes do not move their weight when the



### **GANNET CONTINUED:**

chicks start to hatch and crush them . More experienced ones move and rapidly transfer the young onto the top of the feet.

**JET BLACK BABIES** - the young are black at first, thus reminding the aggressive male not to attack his young, later the larger chick becomes a halo of white fluff before moulting into its first swim & flight suit of brown speckles.

**VICIOUS BEAKS** - gannets nest out of reach of the stabbing beaks of their neighbours.

**NOISY** - they are noisy all the time - this is supposed to stimulate the sexual hormones, there was one gannet trying to nest on St Margaret's Island in 2004, but it would need about 50 others if its to start breeding successfully and for the choir to be big enough.

**FLIGHT SPEED** - 80 kph

### **Manx Shearwater** L = *Puffinus puffinus* W = *Aderyn drycin manaw*

**WHAT'S IN A NAME?** - It glides with stiff, straight wings over the surface of the sea, occasionally banking or 'shearing'. 'Manx' because it was first identified on the Isle of Man.

**Local name** - Cocklolly.

**HONEYMOON** - Once mated the female goes for a short holiday or honeymoon to eat loads of good quality food to form the egg and come back to lay it and take the first incubation shift. Incubation is then shared with the males.

**POPULAR PEMBS** - there are nearly 150,000 breeding pairs of shearwaters on Skomer & Skokholm (no rats or other ground predators). Sometimes 30,000 birds an hour can be seen off St Govans, Lydstep Headland and Strumble heading to the islands for night fall.

**NIGHTLIFE** - Entirely nocturnal. The parent birds feed at sea during the day but as dusk falls they gather in the bays near the islands in large social groups. The males arrive first and hang around whereas the females tend to fly straight in to their burrows after dark.

**EERY SCREAMS** - communications at night are with loud calls, this cacophony gave Skomer the name of the 'island of the lost souls.'

**STREAMLINED LEGS** - their legs are pink and black in colour and flattened from the sides. The legs are positioned right back on their bodies (engine on the transom)-ideal for paddling but bad for walking around - come close to land in the light and they're dead fodder for ravens, buzzards or great black backed gulls.

**LIVING IT UP** - they share burrow entrances with Puffins and take winter holidays (September to March) eating anchovies in Brazil.

**AGE OLD BIRDS** - max lifespan= 49 years.

**CRAZY VICTORIANS** - Victorians dragged chicks from their burrows, killed them and then ploughed them into the soil as fertiliser. The chicks were also used as lobster pot bait.

**CANNY FLYERS** - up to 50mph with hardly a wing beat. The first birds to demonstrate navigation skills - use sun and stars particularly, if you release them on a dark cloudy night they do get delayed in getting back to their nest and egg.



## WHALES, DOLPHINS & PORPOISES

### **Bottle-nosed Dolphin** L - *Tursiops truncatus*

**WHAT'S IN A NAME?** - Tursiops = porpoise:

truncatus = face with a nose or trunk?

**ATHLETIC** - acrobatic, bow riding, jumping over each other, back flips etc .

**HERD** - smaller **pods** of 7 or more inshore merging to hundreds offshore making a **herd**.

**LONGEVITY** - 20 years (max 48 years)

**TEETH LIKE TREES** - slice through a tooth and count the number of annual rings. This tell you the age.

**SIZE** - 2.3m to 3.8m .

**BREEDING SEASON** - calves born every 2-3 years in spring summer, suckled for 18 months but eating fish by 6 months.

**FOOD** - locally abundant fish e.g. mullet, mackerel, octopus and cuttle fish.

**MUNCHIES** - Adult dolphins eat approximately 4 to 5 percent of their body weight in food per day. A nursing mother's intake is considerably higher: about 8 percent.

**DIVING** - **Coastal herds** dive in waters 30m deep or less. **Offshore herds** dive to 600m

**TIGHT THROAT** - A strong sphincter muscle in the throat enables dolphins to swallow their food without taking in too much seawater.

**SLIPPERY GRIP** - Teeth form interlocking rows of conical pegs, suitable for holding slippery fish. They eat their fish whole & headfirst.

**TEAMWORK** - they co-operate to catch prey using calls to coordinate hunting.

**THUGS** - they are social animals; more mature animals will defend the young from predators yet at certain times of the year mature males are kept away from females and calves to reduce baby battering. Adult animals will co-operate to bully or kill porpoises and sharks.

**THREATS** - sharks, human disturbance, habitat loss, loss of prey, pollution, entanglement in nets and pollution.



### **Common Dolphin** L - *Delphinus delphis* White bellied or Saddle back dolphin

**WHAT'S IN A NAME?** Latin and Greek for dolphin, lots of different races round the World and one of the most abundant hence Common.

**SIZE** - 2.6m; 135Kg.

**LONGEVITY** - over 30 years.

**RECOGNITION AT SEA** - large sociable groups of colourful dolphins .

**BEHAVIOUR** - acrobatic and lively riding bow & stern waves.

**BREEDING SEASON** - all year round; gestation nearly a year; calf is fed up to 19 months.

**TEAMWORK** - **COMMON DOLPHINS** co-ordinate their fishing often at night times as the plankton rises to the surface.



## **Risso's Dolphin** L - *Grampus griseus*

**WHAT'S IN A NAME?** Grampus means 'big fish' and 'griseus' is grey, so big grey fish!

**ANCHOR NECKLACE** - all Risso's have an anchor shape on their chests.

**WHITE WITH AGE** - calves are a light grey colour but adults are white with dark flippers and fins.

**SCRATCHES** - fighting and play scars, no scratches on the young.

**CHUNKY CHAPS (& CHAPESSES)** - max size=3.85m long and 500Kg weight.

**LONGEVITY** - no one knows how long they live to but sexual maturity comes at about 13 years or at over 2.17m length.

**DEEP FOOD** - dive to 60m or more to catch squid but will feed on anything if its easy pickings like the seasonal bounty of herring that can flood out of Milford Haven in May.

**GROUPIES**- animals like to be in small groups or herds, sometimes with different species.

**ACROBATS** - they can be acrobatic, leaping out of the water, flipper slapping and spy hopping.

**MUSICAL IDENTITY** - they use whistling calls to identify each other and communicate.

**CROSS BREED** - Risso's have been known to breed with bottle nosed dolphins, the result is a fertile cross!



## **Common/Harbour Porpoise** L - *Phocoena phocoena*

**WHAT'S IN A NAME?** Latin for porpoise, and harbour because they turn up frequently in bays.

**PUFFING PIGS** - is a local name which refers to the noise they make when they surface.

**SIZE** - 55Kg and 1.55m - biggest ones are the same size as a tall man - except the porpoise would be female, males are smaller. Both have an almost triangular dorsal fin.

**LONGEVITY** - most live to 9 years but record is 14 years.

**DEEP FOOD** - they feed in murky and deep waters (200m or more) on fish like herring, pollack and hake.

**NO JUMPING** - Unlike other cetaceans porpoise are not acrobatic and do not jump out of the water..

**SLEEPY HEADS** - they do sleep. To avoid detection by one of their enemies, the shark they stay very still and sleep on the surface, often in traditional areas of the sea

**MATING** - there is a suggestion that there is migration to an area where males and females meet up to mate - Numbers seem less in June but return to Spring levels in July.

**PREGNANCY** - 11 month gestation and give birth in the summer. Females mature earlier than males. Females start breeding at 3 years, males between 4-5 years.

**THREATS** - often in conflict with fishermen and their nets - many deaths - international problem - found all round the N. Atlantic. Chemical and noise pollution may also threaten this species.



## WHALES, DOLPHINS & PORPOISES

### **Minke whale** *L - Balaenoptera acutorostrata, Lesser rorqual, pikehead*

**WHAT'S IN A NAME?** - sharp shaped jaw = Acutorostrata. Lesser rorqual because its so small compared to the rest of the whales of this type.

**SIZE** - Adults can be 7-10 m long weighing between 5 and 10 tonnes. Females are usually the larger animals.

**LONGEVITY** - from analysing their ear plugs 60 years.

**BEHAVIOUR** - can be curious about boats.

**SEX MATURITY** - 14 years.

**FOOD** - feed during the summer and fast during breeding, feed on swarming animal plankton, and schools of small fish.

**DEEP DIVERS, NOT** - dives rarely last longer than 12 minutes, usually 2 minutes - never wave their tails (or flukes) as they dive.

**SOUND WHALE** - Minke whales make very loud sounds, up to 152 decibels (as loud as a jet taking off). They make a series (trains) of grunts, thuds, and raspy sounds, usually in the 80 Hertz to 20 KHz range. These sounds may be used in communication with other Minke whales and in echolocation of food.

**SPEED** - normally swim at 4.8-25 kph, but can go up to 29-34 kph in bursts when in danger. Feeding speeds are slower.

**THREATS** - include hunting, human disturbance, habitat loss, prey depletion, pollution, entanglement in nets and collisions with vessels.



### **Long finned Pilot Whale** *L = Globicephala melas Blackfish, or pot head*

**WHAT'S IN A NAME?** Pilot because they accompany fishermen towards shoals of fish or the way one whale seems to lead the others. The latin means black globe head.

**SIZE** - differences between the sexes is obvious: mature males are up to a metre or so longer than females and almost double their maximum weight. Males are 4-6.5m; females are 3-5.5m.

**LONGEVITY** - Female long-finned pilot whales live longer than males, and may live for 60 years or more. Males generally have a life span of around 50 years.

**FOOD** - squid and when none of this is around they will take any locally abundant schooling prey like mackerel, herring, whiting.

**FEMALE STABLE PODS** - Long-finned pilot whales tend to live in groups or pods of 6 animals (can be many more) usually with a dominant female. This female will have been



### **LONG FINNED PILOT WHALE CONTINUED**

born in the group and many of the other animals are related i.e. aunts, mums, sisters and dads.

**DEEP DIVERS** - on the edge of continental shelves, since they prefer deep water and can dive down to 600m.

**SPEEDY** - speeds average 3.3 kph, with bursts of up to 16 Kph.

Daily movements may be over 200 km.

**MORNING SIESTAS ON THE SURFACE** - they often just rest on the surface for about 15 minutes, following night time foraging activities.

**HEAVY METAL** - Their muscles and flesh can contain high levels of mercury and cadmium

**STRANDED** whales have died of the bends with tissue damage in the brain and other vital organs making them look all bubbly like aero bars.

**THREATS** - include hunting, human disturbance, habitat loss, loss of prey, pollution, entanglement in nets and collisions with vessels. Long finned pilot whales are very prone to disturbance from underwater noise pollution from particularly seismic and sonar testing in the oceans which interfere and confuse their communications.

### **Killer Whale or Orca L - *Orca orcinus***

**WHAT'S IN A NAME?** - killer because it was seen to feed off other dead whales and catch live seals.

**SIZE** - Female killer whales can grow up to 7.9 m with a 1m dorsal fin while males are larger than the females growing up to 8.5 m with a 2m high dorsal fin.

**LONGEVITY** - 50-80 years old.

**SEXUAL MATURITY** - males reach breeding age when they are around 6.7 m long while

females can breed when they are about 16 feet 4.9 meters long.

**BREEDING** - breed all year around and calves are born about 8 feet 2.4 m long after a 17 month gestation period. Female killer whales usually give birth every 3 to 10 years.

**HUNTING** - Killer whales have 48 to 52 large cone shaped teeth which are curved inwards and backwards so that they can grab hold their prey.

**VARIED DIET** - Regularly eat animals like common seals & porpoises or fish like herring. They eat their fish whole & headfirst.

**TEAMWORK** - they co-operate to catch prey using calls or vocalisations co-ordinating their actions into an invincible feeding force.

**STUNNING** - the fluke (Lobe of the tail) is used to stun their prey, herring are whacked and common seals and porpoises have been seen to be played with like a ball between several hunting animals.

**THREATS** - include hunting, human disturbance, habitat loss, loss of prey, pollution, entanglement in nets and collisions with vessels.



## ATLANTIC GREY SEAL

**Atlantic Grey Seal** L: *Halichoerus grypus* (Greek and translates as 'Sea Pig with a hooked nose') W: Morlo Other: Horse head, great seal.

**Pembrokeshire:** Year round, especially on haulouts around the islands. Aug to Nov large numbers around breeding sites: Ramsey, North Pembrokeshire coast, Skomer, Marloes peninsula, Castlemartin range.

### DID YOU KNOW

**Grey seals?** Colour varies from dark grey to pale cream, often mottled brown to silver and can even have ginger spots - who called them grey seals?

**Big nose:** They have an elongated muzzle and a snout that is convex in profile, giving a 'Roman' nose. The male also has a very heavy neck and shoulders.



Males are **bulls**, females are **cows** and babies are **pups**. A group of seals can be called a **herd** and a breeding site is known as a **rookery**.

**Britain's largest mammal:** Bulls can grow to 2m and weigh 36 stone (230kg), cows are smaller 1.8m and 23 stone (150kg).

**Old cow:** A 46yr old cow was recorded from Shetland and the oldest bull was 29 from Canada. On average cows reach 30 becoming sexually fertile between 3 and 5 whilst Bulls reach 20 and are 10 before they successfully hold position in a breeding group.

**Swimming machines:** they have elongated torpedo bodies encased in blubber to pad outline and round off the corners creating a streamline smooth hydrodynamic shape. Modified legs and arms form stiff webbed paddles that propel them through the water. They average 4 mph with quick bursts at greater speed.

**Coping with the cold:** Heat loss is minimised by 6cm thick blubber and a double fur coat.

**Breath holders:** They can stay underwater for 5-6 minutes at a time and spend 80% of the time below the surface. This is done by taking down large reserves of oxygen attached to chemicals in the blood and muscles. Their heart beat also increases 4 times from 40 beats/min underwater to 120 beats/min on the surface to allow them to quickly take in new supplies of oxygen and get rid of waste carbon dioxide.

**Deep divers:** Grey seals have been recorded at 70m depth and can possibly go deeper, but usually they feed in shallow coastal waters.

**Fish dinner:** Studies reveal that fish dominate the menu, with the occasional squid and shellfish. It is estimated that the daily intake is about 11lbs (5kg)/day.

**Chilling out:** Seals can sleep in the water and are often seen 'bottle nosing' they also rest by hauling out on rocks at low water.

**Moulting:** An annual moult takes place during the winter, bulls come ashore in December and cows in February. The largest assemblies are found on remote beaches of the offshore islands where 150-200 seals are often seen on one beach.

**Pupping, milk and mothering:** Cows return to the same breeding areas and sometimes the same beaches each year between August and November. Once the pup is born it usually feeds within 6 hours, the bond of pup and mother is very strong. To help the pup locate her nipples the cow will flap her fore flipper, known as 'flipping'.

**Super milk:** Pups will feed 4-5 times a day, and treble their birth weight in 3 weeks. Seal milk is 60% fat and more like cream allowing the pup to put on 4.5lb (2kg)/day.

**Crash diet:** Cows loose around 9.5lb (4kg)/day, losing up to 50% of their body weight giving birth and feeding their pups, they do not feed whilst lactating. They use about 30,000 Kcal/day, to replace that energy they would need to eat 70 cream buns per day.

**Abandoned pups:** After 3 weeks the 'milk bar' is closed and the pups are left to explore the big wide world.

**Pup development:** Pups can be aged from their body shape development and behaviour.



**Class I (0-5 days)**

Body contour thin, neck well-defined, skin in loose folds around body. Coat may be stained yellowish. Movements rather uncoordinated.



**Class II (6-10 days)**

Outline smoother with neck still recognisable but no loose folds on body. Coat whiter. Vocal.



**Class III (11-15 days)**

Outline rounded to barrel-shaped. Neck indistinguishable. White coat.



**Class IV (16-20 days)**

Patches of white fur moulting to reveal under-yearling pelage. These pups are either weaned or approaching weaning.

**Fathers role:**



Bulls do not help with pup rearing. Bulls station themselves off rockeries defending an area ready for breeding, these are 'maritories' (marine territories). Bulls will compete by roaring and threat gestures with occasionally fighting. In order to maintain their maritory they do not leave to feed and will loose around 4.5lb (2.2kg)/day.

ight after a cow leaves her pup but bulls often harass them before they have finished feeding. The fertilised egg divides 4 times then stops, development is suspended for 3 months 'delayed implantation' then under the influence of hormones begins development. This means that the cow has a chance to get her fitness back and ensures that pupping occurs at the same time each year.

**Long distance travellers:** Grey seals disperse to feed. Some stay close to their breeding sites whilst others travel long distances. Pembrokeshire seals have been recorded around Cornwall, France and Ireland. Radio tracking has shown seals to travel 800 miles in 25 days.

## COAST PATH ANIMALS

### **Slow Worms** L - *Anguis fragilis*

**WHERE?** - they live in rough grassland along the coastal path.

**FOOD** - slugs, spiders and beetles.

**LEGLESS LIZARD** - not a snake but a legless lizard with tiny scales that give it a metallic look, the females are golden and males browner in colour.

**WINTER HIBERNATION** - October to March.



### **Adders** L - *Vipera berus*

**THE ONLY ONE!** - the adder is the only poisonous snake native to Britain.

**USEFUL POISON** - they use the poison to disable and kill their prey and to defend themselves. No humans have died from an adder bite for years.

**MINI ME** - females do not lay eggs but give birth in late August / early September to perfect mini adders about the size and shape of an earthworm.

**HIBERNATION** - adult snakes follow scent trails left by other adders to find their way back to the same hibernation site each year.

**FOOD** - small rodents, lizards, frogs and newts, and nestlings of ground nesting birds.

**MOUTHFUL** - prey are eaten whole, the teeth are designed to grip the prey as it is swallowed. The jaws are connected by strong stretchy tissue so the bones of the jaw can literally be pulled apart letting them swallow things much larger than the width of their head. The lower ends of the ribs are not joined as in most animals and can open right out.

**CORROSIVE STOMACH ACID** - The adder's digestive fluid is amazingly powerful and will digest the flesh and bones of their prey almost completely, leaving only the hair and teeth.



### **Common Lizards** L - *Lacerta vivipara*

**LIGHTNING REFLEXES** - you have to be quick to see these basking on walls and they use speed to catch flies and escape danger.

**DROPPING BODYPARTS** - a lizard can escape the grip of a predator by dropping off the end of its tail, but the second time round the predator will get the lizard as the tail does not re-grow



### **Bloody-nosed Beetle** L - *Timarcha tenebricosa*

**WARNING DISGUSTING MOUTHFUL** - few predators eat these beetles as when you pick it up, it oozes a foul-tasting, red liquid from the mouth.

**WHEN?** April to June.

**LARGEST** Leaf beetle in the UK.

**LOADS OF BEETLES** - 4,000 species in Britain, forming the largest order of insects.



### **St Marks Fly** L - *Bibio marci*

**PATRON SAINT**- the fly emerges at the end of April around St Mark's Day, 25th April. St Mark is the patron saint of Venice.

**LOTS OF 'EM** - these flies perform mating 'yoyo' dances in the sunlight, they carry their feet as if they have very heavy boxing gloves on.

**ANNOYING** - harmless but annoying. They get up your nose and in your mouth & eyes.

**ROTTEN GRUB** - the larvae live in the soil and rotting vegetation.



### **Red Admiral** L- *Vanessa atalanta*

**WHATS IN A NAME?** The name admiral is a corruption of the word admirable which refers to its admirable bright colours.

**CUPBOARDS & CORNERS** - some do successfully hibernate here throughout the winter, waking up when the warmer weather comes or the central heating goes on.

**MIGRANTS** - Most red admirals seen in the UK arrive here in the spring after flying north from Southern Europe. The arrivals lay their eggs singly, on the upper surface of nettle leaves. By the middle of summer a whole new generation of red admirals will be on the wing. In autumn many fly south to return to Southern Europe.



### **Painted Lady** L - *Cynthia cardui*

**WHATS IN A NAME?** - they are highly painted colourful beautiful butterflies.

**MIGRANT** - a summer visitor to Britain for the plentiful supplies of fresh nectar, travelling several hundred miles to get here from the north Africa and southern France.

**FRESH & YOUNG** - Their offspring emerge as butterflies between September and October, and although many die with the onset of cold weather, it is believed that some make the return migration to North Africa in place of their parents.



### **Silver-Y moth** L - *Autographa gamma*

**MIGRANTS** - Silver-y's can turn up in their thousands along the coast.

**ARCTIC WANDERERS** - they fly north in the spring from southern Europe, some fly as far as the Arctic but the UK moths arriving in May .

**CABBAGE & CLOVER MUNCHIES** - they lay their eggs on clovers & cabbage plants, which the caterpillars then devastate.

**SUMMER & AUTUMN** - still around but any late stayers get killed by frosts.

**DAY FLIERS** - feeding on clovers but are also attracted to light at night.

Text and Pictures by A Sutcliffe. Silver-y moth copyright of Ron Elliott.



## FLOWERS OF THE COAST PATH

### **Scurvy Grasses** - includes Danish Scurvy Grass

**NOT A GRASS** - a coastal and saltmarsh plant

**VITAMIN SUPPLEMENT** - taken on board ships to chew for its vitamin C content to stop scurvy - it tastes disgusting though!

**WELL TRAVELLED** - usually grows in coastal areas but can now be seen on road verges and central reservations across the country due to gritting/salting of roads in winter

**SPEEDY SEED** - Spread by wind but now traffic wafts the seeds as fast as 10 - 15 miles per year to new germination places in the well drained soils at the edges of the roads



### **Sea Campion**

**CLIFF HANGER** - grows on the edges of cliffs just above the splash zone.



### **Ox-eye Daisy** - dog daisy, moon daisy, moon penny, marguerites

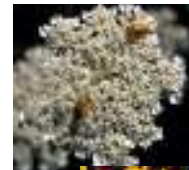
**ORGANIC** - used to be common in fields all over the UK but herbicide sprays killed it so it's a tribute to our pollution free coastal vegetation that it grows so well in Pembrokeshire.



### **Wild Carrot**

**WHATS COOKING** - smells of carrot but the root is thin and wire-like.

**MIMIC** - In late summer the white platform of flowers has a dark central point which is in the shape of an insect so sending messages to other insects to come on down and pollinate



### **Stonecrop**

**WHITE OR YELLOW?** Beads of succulent green with flowers of white for the English Stonecrop and yellow for the Biting Stonecrop

**LONGEST COMMON NAME** in the British plant list which is 'Welcome-home-husband-though-never-so-drunk.'



### **Lesser Celandine** - spring messenger

**PILES** - known as Pilewort because of the pile shaped roots, a stew of these was said to help sufferers!!



**Birds Foot Trefoil** - Egg and Bacon, Grandmothers slipper

AKA - this plant has 72 common names more than any other UK plant



**Ladies bedstraw** - Lady's tresses

**FLEA BITES** - when dried this plant was used to stuff mattresses as it was an effective flea repellent

**CLOTTING** - used to stem the flow of blood and also to make cheese, being a vegetarians answer to curdling milk



**Alexanders** - parsley of Alexandria

**ROMAN INVADER** - introduced from the Mediterranean and now grows abundantly near the sea in southern Britain.

**HOLY LINKS** - grown in medieval monastery herb gardens and eaten like celery, the roots were roasted and the green flowers that look like mini cauliflowers were pickled and eaten raw.

**SPRING TONIC** - a tea of the leaves had health giving properties and was an old fashioned way of taking your vitamins.

**NOT TRENDY** - Up to the eighteenth century it was grown in villagers gardens but celery replaced it in popularity probably because it does have a rather horrid smell & taste so it was left to escape and grow wild through our seaside hedges.



**Nettle**

**WILD SPINACH** - good to eat when the shoots are young- it's like spinach

**OLD ROPE** - stringy old plants were used to make rope

**PEE** - Where it grows marks soils that have a lot of nitrogen ie very fertile because of a dung heap or maybe where the gentlemen pee!

**POISON NEEDLES** - Stinging cells are the hairs on the leaves of the plant, the more fertiliser in the soil the more stinging cells there are



**Thrift** - Ladies cushions, sea pink, cliff clover,

**WHATS IN A NAME?** - thrift because of its tight and economic growth form: deep tap root, thin whorled leaves

**MONEY SPINNER** - was pictured on the thrupenny bit coin.

**POPULAR LOCAL** - voted to be Pembrokeshire's flower emblem in the National Plantlife competition.



Text and pictures by A Sutcliffe

Pictures of Scurvy Grass, Wild Carrot and Stonecrop by J Archer-Thomson

## FLOWERS OF THE COASTAL PATH

**Lords & Ladies** *Jack in the Pulpit, Parson in the pulpit, Willy lily*

**RUDE ELIZABETHANS** called it Cuckoopint. (pronounced cuckoomint) Pint was short for 'pintle' which in Elizabethan times referred to the male anatomy

**GLOW IN THE DARK** - The pollen glows in the dark hence the name Fairy Lamps or Shiners.

**INSECT STEW** - The liquid in the bottom of the flower dissolves fallen insects and adds to the 'diet' of the plant!



**Red Campion** - *Cuckoo flower, Robin Hood or Adders Flower*

**NOT JUST RED** - white & pale pink variants regularly occur, acres/hectares of it on Skomer May/June



**Bluebells** - *Crows Toes*

**SPANISH INVADERS** - a spanish variety is rife in the UK but not in Pembrokeshire yet

**SHADEY PLANT** - indicate where woodland used to grow, nowadays the bracken takes on the role of shade provider.

**GLUE** - the sap of bluebells can be used as paper glue



**Foxgloves**

**BEE BACKPACKS** - pollinated by bees tempting them into the flower tube and dosing them with a good load of pollen on their backs as they suck the nectar of the flower.

**HEART STOPPER** - This plant contains a heart drug - digitalis - which slows the heart



**Ivy leaved Toadflax** - *Mother of thousands, Travelling sailor*

**FOREIGNER** - A wall climber introduced from southern Europe in the 17th century probably as seeds on marble sculptures brought from Italy.

**OXFORD LINK** - For a while it was known as the 'Oxford weed' but it was planted all over the place to adorn walls in formal gardens and is now naturalised throughout Britain.

**SUNLIGHT** - the flowers thrust out towards the light but as the seeds form they bend away from the light back into the wall



## **Common Knapweed** - *Hardheads, Paintbrush*

**TITIVATION** - An 18<sup>th</sup> century love tease game. The girls would pluck the purple flowers out of the brown outer cup and tuck them in their cleavage. It was said that if they met their true love then the flower would begin to grow again!



## **Thyme**

**SMELLY SMALLS** - thyme flowers were used to scent underclothes & bed linen

**ANTISEPTIC** - thymol the oil that makes thyme smell is an antiseptic

**QUIET NIGHTS** - drunk as a tea regularly on the Scottish islands to prevent nightmares and help peaceful sleep

**MAUNDY THURSDAY POSY** - the sovereign or Queen's posy had a lot of thyme in it in order to protect her from the infectious diseases of the poor!



## **Gorse**

**KISSING TIME** when it's in flower - so **European Gorse** starts in Jan/Feb and **Western Gorse** ends in Nov-Dec ie almost the whole year!

**STOCK PROOF FENCING** planted on top of the earth and stone banks.

**CATTLE FODDER** - Fields of gorse were cut for cattle and horse feed. Men got about 5 shillings an acre for cutting the gorse. The new fronds are highly nutritious and when chopped into chaff sized lengths by the gorse mill highly palatable for the horses that worked the land.

**GREEN DYE** - The flowers of gorse when boiled in water produce a green dye - used as a colouring for Easter Eggs.

**KINDLING** - Gorse was used to fire bread ovens and limekilns

**CHIMNEY BRUSH** - Bushy branches made excellent chimney sweepers

**PRICKLY TURN OFF** - Some allotments still use chopped "fuzz" to STOP mice and pigeons from pinching the tender crops as they germinate.

**PROTECTION AT SEA** - In some areas around Britain the gunwhales of boats would be singed with a burning bow of gorse to ward off bad spirits during the fishing season.



### Fact file: Geology of North Pembrokeshire

The oldest rocks in Pembrokeshire are of late Precambrian age and may be as much as 650 million years old (my). These volcanic rocks are probably the oldest anywhere in Wales but the oldest rocks in Britain occur on the Isle of Lewis and adjacent coast of Scotland and are around 2,700my. The oldest surviving rocks in the world are c. 4,000my, compared to c. 4,700my which is the approximate age of the planet Earth.

The Precambrian rocks of Pembrokeshire represent the products of volcanic eruptions and they are mainly composed of ashes mingled with larger fragments of volcanic rock.. Molten rocks then passed up through the layers of ash & lava but cooled and crystallised before they reached the surface, producing intrusive igneous rocks such as the St David's Microgranite and the Johnston Diorite. The latter is quarried at Bolton Hill and even if you've never visited the quarry you'll be familiar with this greenish-grey rock because it is spread as 'chippings' over all the roads in the county.

The volcanic landscape was weathered and eroded before deposition of the Cambrian sedimentary rocks commenced when the sea flooded the land. A very distinctive pebbly beach rock was produced as the shoreline migrated over the land. This 'basal conglomerate' can be seen on the coast path at St Non's and near Porth Selau.

The distinctive red and purple rocks a little higher in the Cambrian sequence (as seen at Caerfai Bay, Caerbwdy Bay and St Justinians) were derived by erosion of brightly coloured volcanic rocks of the Precambrian outcrop. These rocks have yielded a few fossils which are some of the earliest representatives of marine creatures with shells. Before this sea creatures were soft bodied (eg jellyfish).

The Cambrian rocks of the St David's area are famous for their trilobite fossils, but these are very hard to find. If you do find one please don't take it out of the rock, take a photograph instead (\*if possible e-mail a copy to the CCW geologist ( [s.howells@ccw.gov.uk](mailto:s.howells@ccw.gov.uk) ,tel: 01646 62400)

CCW (the Countryside Council for Wales) is the organisation responsible for nature conservation in Wales, and maintain records of Sites of Scientific Interest (SSSI) and other important information.

Similar rules apply to the famous graptolites in the Ordovician rocks at Aberiddi, but you can collect from the beach material because the slates in which these fossils occur would otherwise be quickly ground down. The black slates were originally organic-rich muds deposited in a deep marine basin situated near the South Pole (\*see the South Pems fact sheet for details). The graptolites were planktonic marine creatures.

The Ordovician rocks of Pembrokeshire also show evidence of widespread volcanic activity. The pillow lavas of the Strumble area were formed by gentle effusion of basalt lavas onto the seabed but the rhyolitic tuffs of the Fishguard area and Ramsey Island are the products of violent underwater eruptions. The tors of the north Pems coast and Preseli Hills are mostly dolerites but gabbro occurs at Carn Llidi and St David's Head. These rocks were formed when magma cooled and crystallised at considerable depth beneath the sea bed. The tors near Treffgarne are Precambrian rhyolites.

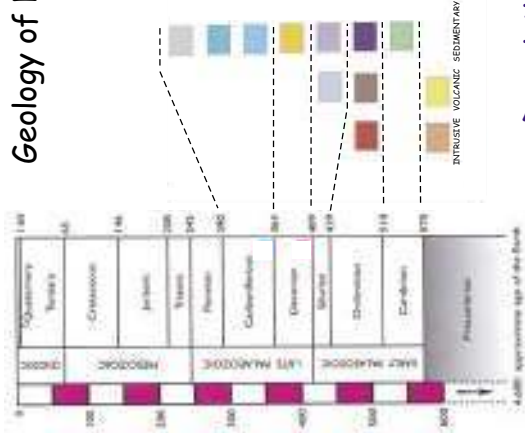
North Pembrokeshire was covered by ice on several occasions during the so-called 'Ice Age' (generally much colder than at present but also warmer for relatively short periods). This ice moved southwards as part of the Irish Sea ice sheet (probably similar in appearance to the Ross Ice Shelf of Antarctica) fed by glaciers in mountainous areas of the western coast of the mainland and along the eastern side of Ireland.

During one advance the ice reached the south coast of the Bristol Channel and probably carried the Preseli 'bluestones' (spotted dolerite) most of the way to Stonehenge (archaeologists may disagree but attempts to recreate their version of events have not been too impressive!).

As the ice melted swollen rivers (initially flowing through ice caves) cut the deep valleys of north Pembrokeshire (eg. Gwaun and Solva). Rising sea level created Milford Haven and the shingle ('cobble/pebble') beaches at Newgale, Abermawr and elsewhere

**Cliff hazard: note that in many places cliffs edges are unstable. Please keep to the footpath. Never throw anything over the cliffs. For foreshore visits check tide tables and beware of storm waves.**

## Geology of North Pembrokeshire



### Description

#### Carboniferous: 'Coal Measures'

Grey sandstones & siltstones often iron-stained, black shales, and thin anthracite coal seams. Plant fossils common; also yields freshwater mussels. Pectenoid bivalves & goniatites found in 'marine bands'.

sedimentary rocks: delta environment

#### Carboniferous: 'Millstone Grit'

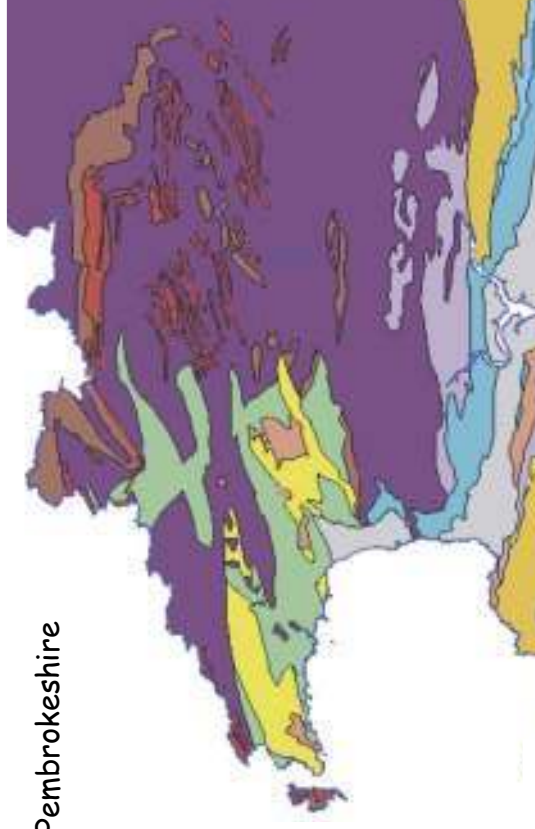
Rocks similar to Coal Measures described above. Sequence consists of Basal Grit, Middle Shales & Upper Grit

terrestrial & marine sedimentary rocks: delta & shallow marine

#### Carboniferous Limestone

Grey coloured and crystalline rock, largely composed of calcium carbonate derived from finely comminuted shell fragments and other biogenic material (eg. corals, crinoids).

marine sedimentary rocks: shallow coastal shelf



### Key Locations

Nolton to Newgale  
Broad Haven  
Hook, Picton Point, Landsshipping

Haroldston Chins ('Chines')  
H.west to Druidston \*north-facing scarp

Luchurch Quarries

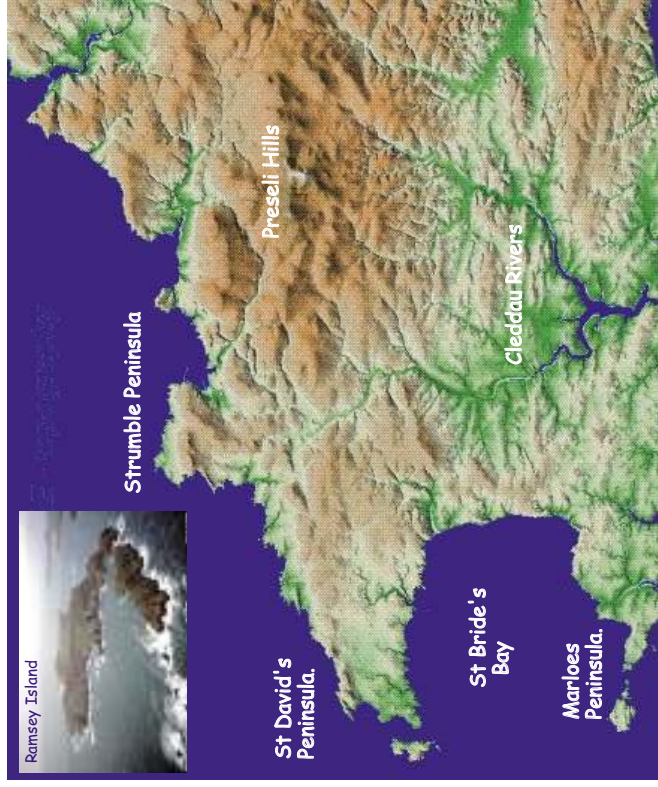
<p><b>Silurian - Devonian rocks</b> distinctive rocks of the Old Red Sandstone (ORS) include siltstones, mudstones and conglomerates.</p>	<p><b>Tavernspite to Minwear Wood</b> * prominent ridge, height decreasing westwards</p>
<p><b>Silurian rocks</b> greenish-grey siltstones and sandstones or grey calcareous mudstones, sometimes rich in fossils including brachiopods, corals, trilobites, gastropods conglomerate at base of sequence</p>	<p>Haverfordwest to Llandewi Velfrey * ridge &amp; vale scenery</p>
<p><b>Ordovician rocks</b> black mudstones with slaty cleavage, interbedded with sandstones in NE Pembrokeshire</p>	<p><b>Strumble Peninsula</b> Fishguard area, Carn Alw St David's Head, Carn Ingli, Carn Meini</p>
<p><b>Cambrian rocks</b> Conglomerate at base, overlain by distinctive green, bright red and purple rocks (sandstones and mudstones). Middle part of sequence includes black mudstones.</p>	<p>St David's Peninsula</p>
<p><b>Precambrian rocks</b> volcanic rocks, mostly coarse tuffs, but also including lavas</p>	<p>Treginnis Peninsula &amp; Cwm Bach Roch to Treffgarn Gorge Carreg Fran Borough Head, Bolton Hill Quarry</p>

## Geomorphology:

the dissected plateau (60m marine erosion surface) of the coastal areas contrasts markedly with the uplands of the Preseli Hills (highest point 1038 m) which are fringed by higher plateau remnants. Tors (rocky protrusions from ridges or slopes) developed on igneous intrusions are a common feature of the hills and the north Pembrokeshire coastline. The Western Cleddau and the Eastern Cleddau/Afon Syfnwy rivers have well developed basins in parts of their courses but in other places are deeply incised.

The drainage is superimposed (ie originally developed on a higher level surface) - it cuts across the geological 'grain' (outcrop pattern) as seen as Treffgarne Gorge.

North Pembrokeshire: topography —



### Volcanic history

North Pembrokeshire has numerous examples of volcanic rocks, including Precambrian ashes on the Treginnis Peninsula and Ordovician basalt pillow lavas of the Strumble Peninsula. Ordovician rhyolites extend from Fishguard to the northern slopes of Carn Ingli & eastern Preselis and are also found on Ramsey Island. Basaltic lavas of Silurian age are exposed on Skomer and near Marloes.



lapilli tuff



polygonal/columar joints



'Bluestone'



pillow lava



rhyolite



autobrecciated rhyolite

### Fossils

Trilobites are found in rocks of Cambrian to Silurian age in North Pems. Graptolites are common in rocks of Ordovician age. The Silurian rocks of the area are rich in coral and brachiopod fossils.



trilobite



brachiopod



graptolites



brachiopod



coral

### Industrial heritage

There are numerous examples of disused workings for natural resources (eg. slate, building stone, coal) in N. Pems



Rosebush



Porthgain



Abereiddi



Trefran

## Fact file: Geology of South Pembrokeshire

The oldest rocks in this area, striped black/brown Ordovician mudstone (c. 470 million years old) and the youngest, naturally cemented dune sands (only c. 8 thousand years old) can both be seen at Freshwater West.

The Silurian lavas of Skomer Island & the Marloes Peninsula were the products of fissure eruptions on a volcanic island much larger than Skomer. It's just a coincidence that another island has been formed by erosion of these rocks. It's an even bigger coincidence that erosion of material from a 360 million old beach is contributing to the present day beach at Martinshaven. \*exposed on rock face beneath jetty access.

The Ordovician rocks of Pembrokeshire were formed on the seabed near the current position of the Antarctic Peninsula. That part of the Earth's crust subsequently moved northwards accumulating more sediments and volcanic products as it went. It crossed the Equator during the Carboniferous Period (c. 310 million years ago).

At Marloes Sands rocks of the Coralliferous Group are rich in fossils formed in warm tropical seas. Think about that when you go for a swim from this very impressive beach! The rocks here have been the subject of study by geologists from around 1820 and sketches of them can be found in a book published in 1839.

The Old Red Sandstone (ORS) sequence, includes mudstones, siltstones, sandstones and conglomerates deposited by braided rivers flowing over coastal plains and tidal flats. The red colour results from iron minerals formed under warm, moist conditions. Some of the sandstones are green, due to iron minerals derived from anoxic groundwaters passing through permeable sand layers.

The ORS sequence yields fossils of some of the first land plants (smaller than a pin and consisting only of a spore case above a thin filamentous root). It also shows evidence of burrows and tracks of amphibious creatures similar to, but much larger than, newts or fiddler crabs. Fragments of armoured fish have also be found.

The ridges of higher ground in South Pembrokeshire are all developed on parts of the ORS sequence that are dominated by sandstones and/or conglomerates.

The Carboniferous Limestone contains numerous fossils. These are clearly visible on beach pebbles in areas where the limestone occurs. On weathered rock surfaces these fossils may stand clear of the surrounding limestone. Please don't try to hammer out these fossils- they usually break and it takes a very long time for new ones to weather out. Use a camera with a macro lens to take nice pictures

instead. Don't forget to place a coin next to the fossil as a scale.

The Carboniferous Limestone contains numerous fissures and caves. These are some of the features of what is known as karst landscape (good examples of which occur in west Yorkshire and County Clare in Ireland). The caves often provide homes for bats which are a protected species and should not be disturbed by exploring the caves or lighting bonfires or barbecues in the entrances.

The coastline in the Bosherton area provides some of the finest coastal limestone scenery in Europe. Stack Rocks, the Green Bridge of Wales, the Devil's Cauldron and Huntsman's Leap are extremely impressive features (but take care when trying to view these landforms - the cliffs edges are often unstable and sudden gusts of wind can occur). Protected species of birds nest on the cliffs and should not be disturbed during the breeding season (mostly from early Spring to Summer). Seals & their pups on the beach should also never be disturbed by approaching them or being noisy.

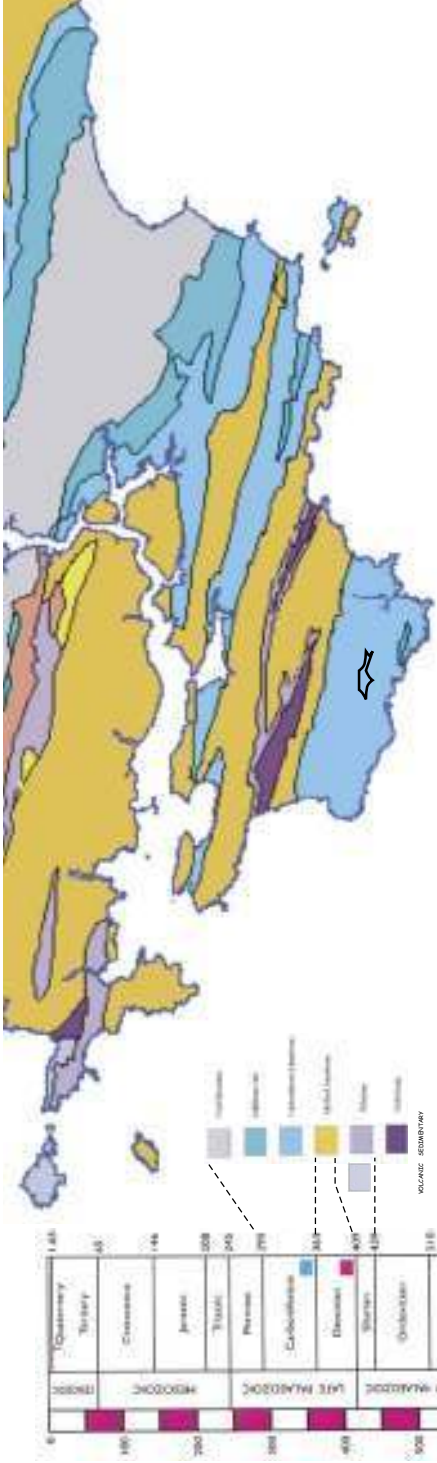
The 'Coal Measures' sequence is of Upper Carboniferous age. The best exposures in South Pembrokeshire occur between Waterwynch Bay and Telpyn Point. These rocks are mostly grey sandstones (usually orange-brown on weathered surfaces due to weathering of iron minerals) or black siltstones and shales. The latter sometimes yield fossil plants which look similar to modern ferns.

Coal occurs in thin seams (locally referred to as veins) and is of anthracite grade (> 90% carbon) but is often intermingled with clay. Metallic sulphide minerals (including arsenic sulphide) are present in low concentrations.. The waste coal (slack) was shaped into culm balls by mixing with clay and/or dung. Iron ore (nodules containing iron carbonate) was another important resource worked from the Coal Measures. The peak of the mining activity was in the late 1800s and natural processes have masked much the evidence that remains.

In places the coastline of Carmarthen Bay has been heavily modified by schemes designed to protect the coastline from erosion and storm damage. Very large amounts of money have been spent on these works which have often been poorly designed and maintained. Sea level is rising slowly and may accelerate due to climatic influences exacerbated by wasteful use of energy resources.

**Rockfall hazard: note that in many places cliffs are unstable and rockfalls are common. Risk assessments should include an evaluation of this potential hazard for every site to be visited.**

## Geology of South Pembrokeshire



### Description

#### Carboniferous: 'Coal Measures

terrestrial sedimentary rocks; delta swamp environments  
 Grey sandstones & siltstones often iron-stained, black shales, thin anthracite coal seams. Plant fossils common; also yields freshwater mussels. Pectenoid bivalves & goniatites found in 'marine bands'.

#### Carboniferous: 'Millstone Grit'

terrestrial & marine sedimentary rocks; delta & shallow marine  
 Rocks similar to Coal Measures described above. Sequence consists of Basal Grit, Middle Shales & Upper Grit

### Key Locations

Waterwynch Bay to Amroth  
 upper part of Dauceddu Estuary (Llangwm, Landshipping, Picton Point, Hook)

Tenby to Waterwynch Bay  
 Telpyn Point to Marros  
 also present in the cores of synclines in south Pems but no good exposures

**Carboniferous Limestone** marine sedimentary rocks, shallow coastal shelf  
 Grey-coloured, crystalline rock, largely composed of calcium carbonate derived from finely comminuted shell fragments and other biogenic material (eg. corals, crinoids). Complete fossils are also common. Clay minerals are present in varying proportions grading into calcareous mudstone-shale. Calcium carbonate is relatively soft so it can be easily scratched and powdered with a geological hammer. It also fizzes vigorously when dilute hydrochloric acid is applied to a fresh surface. The Carboniferous Limestone in the Bosherton area is the thickest sequence in Wales (c.1500m)

**late Silurian & Devonian rocks** terrestrial sedimentary rocks (rivers & flood plains).  
 the Old Red Sandstone (ORS) sequence is very distinctive - the brightest red-coloured beds are siltstones or mudstones and sandstones can be green or purple as well as red. There is a distinctive conglomerate at the base of the sequence. It consists of pebbles of vein quartz in a greenish-grey matrix and was deposited on a beach. In the middle of the sequence there are bright red conglomerates (the Ridgeway Conglomerate)

**Silurian rocks** marine sedimentary rocks - coastal shelf  
 greenish-grey siltstones and sandstones or grey calcareous mudstones, fossils abundant esp. brachiopods & corals

products of volcanic activity and erosion on volcanic island

mainly basalt lavas, together with rhyolites and tuffs

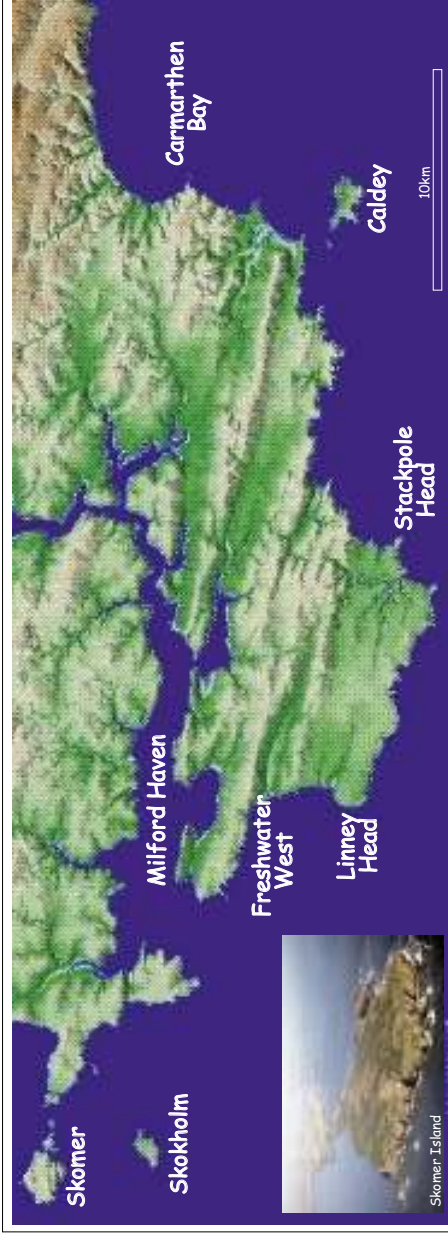
**Ordovician rocks** marine sedimentary rocks - deep water  
 black mudstones with slaty cleavage are present in the cores of eroded anticlines

Stackpole Quay  
 Lydstep Head  
 Tenby (South Cliff)  
 Carew - West Williamston  
 Pembroke

Freshwater East to Skrinkle Haven  
 Freshwater West  
 West Angle Bay (outer headlands)  
 Milford Haven

Freshwater East Bay \* cliff at S end of beach  
 Freshwater West  
 Skomer Island & Marloes Pen.

Freshwater West  
 north-eastern margin of wavecut platform near stream \* often obscured by beach sand



### Geomorphology

The plateau surface of the Bosherton area contrasts markedly with the ridge & vale scenery further north. Some of the finest coastal limestone scenery in Europe can be seen between Stack Rocks & Stackpole Quay. The Old Red Sandstone Cliffs between Stackpole Quay and Skrinkle Haven are generally more rounded in profile.

Milford Haven marks another change, this time to a ria (a drowned river valley and its tributaries). The scenery of the Dauceddau Estuary is also of this type.

Along the western coastline of Carmarthen Bay there are a number of deep river valleys, sometimes terminating in barrier beaches (shingle ridges) such as those at Amroth & Wiseman's Bridge. In places, this coastline has been heavily modified by coastal engineering works.



Stackpole Head



Green Bridge



Priest's Nose



Amroth

## Folds & Faults

The folds & faults (lines of fracture & displacement) in south Pembrokeshire were caused by a collision of continents (resulting from movements of the plates which make up the Earth's crust) that occurred at the end of the Carboniferous Period (c. 290 million years ago).



fold at Cobbler's Hole



folds near Stackpole Quay



fold at Saundersfoot



fault at The Wash



major fault at Manorbier Bay

## Fossils

The fossilised remains of sea creatures, especially corals, brachiopods and crinoids, are common in the Carboniferous Limestone. The Coal Measures sequence includes shales that are rich in plant fossils



brachiopod



coral



coral colony



tree trunk



leaves

## Conservation

Please don't damage geological & biological features or cause unsightly scars by hammering or other actions. Photograph fossils rather than collecting them. For advice, contact Countryside Council for Wales (01646 624000).

# ROCKY SHORES SHEET 1

Steep rocky shores are pretty tough places to live for shore life. The combination of vertical rock faces and lots of wave action means that shore life is constantly battered and removed from the rocks, alongside prevailing winds and sun causing dehydration.



The lower shore is the best place to be as a marine creature, however competition for food and space is rife. Thus some creatures have adapted clever ways of surviving the elements found in the middle and upper shore where competition is lower.

**LICHENS** are 80% fungus forming the structure and 20% algae photosynthesising and providing food, this relationship is called 'symbiosis' as each partner benefits.

In the splash zone yellow, orange and grey lichens can be found forming a striking mosaic of colour on the rocks. These lichens can withstand a high salt content from spray and do particularly well in areas of high nitrogen eg. From bird droppings. Most of these lichens form slow growing leaf like crusts on the rocks with raised knobbly fruiting bodies in the centre.

In the upper shore the rocks look like they have been painted with oil but this is in fact 'black tar lichen'; although it is a terrestrial species it is capable of tolerating brief periods of salt-water

## COMMON SHORE ANIMALS

**Winkles** are the sheep of the shore (along with top shells and limpets) they are vegetarians. When the tide is in they move about over the rocks dragging their tongues over the surface, which scrapes off microscopic seaweed.

Rough winkles have ridges along their shells and small winkles are incredibly small (like a grape pip). Both can be found hidden in old barnacle shells or jammed into crevices.

**Barnacles** start life as plankton floating about the sea. As they grow they settle on the shore, cement their heads to a rock and build a house out of calcium carbonate to finish off looking like a mini volcano. When the tide is in they feed by waving their feathery legs to catch floating bits of food from the water

**Beadlet anemones** have to protect themselves from drying out. They do this by pulling their tentacles in and covering themselves

in a sticky moist slime. Very cunning ones find homes in rock pools or hide in crevices. They use their tentacles to sting and paralysed unsuspecting prey

**Sponges** are very sensitive to drying out so are usually found in deep crevices, caves and rockpools. Breadcrumb sponge is green or yellow and orange sponge is orange. When the tide is in they filter water for plankton and detritus.

**Dogwhelks** are true carnivores; they eat barnacles, mussels, winkles and limpets! Their tongue bores into the shell aided by a cocktail of enzymes. This turns the insides of its prey to soup, which is then sucked up. It can 2-3 days to eat a barnacle and up to 5 for a mussel.

**Limpets** are pyramid shaped snails. They are vegetarians and feed like winkles. They move about when the tide is in and always come back to the same spot on the rock.

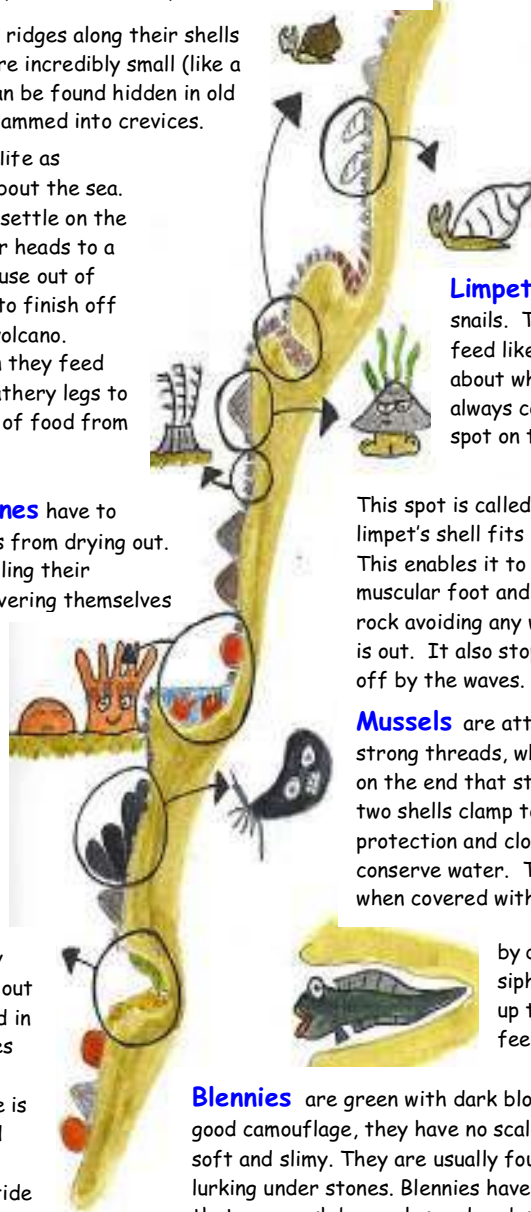
This spot is called the 'home scar' and the limpet's shell fits perfectly to the rock. This enables it to clamp down with its muscular foot and form a tight seal to the rock avoiding any water loss when the tide is out. It also stops them getting battered off by the waves.

**Mussels** are attached to the rocks by strong threads, which have little suckers on the end that stick to the rock. The two shells clamp together to give protection and close at low water to conserve water. The shells open out when covered with water and filter feed

by drawing water through siphons. Those living higher up the shore are smaller as feeding time is less.

**Blennies** are green with dark blotches providing good camouflage, they have no scales and the body is soft and slimy. They are usually found in rockpools or lurking under stones. Blennies have powerful jaws that can crush barnacles and crabs.

Text by Kate Lock Illustrations by Ben Sutcliffe

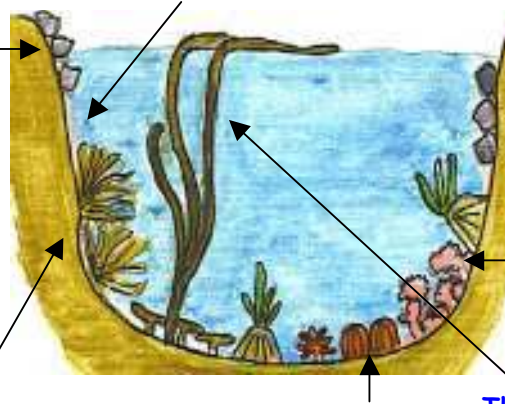


## ROCKY SHORES SHEET 2

### ROCKPOOLS

**Purple top shells** are greyish-green in colour with well-spaced diagonal purple stripes. If you look at the opening you can also see the mother-of-pearl shimmer - a feature of all top shells. Top shells are vegetarians feeding on microorganisms and detritus (dead stuff).

**Encrusting pink seaweeds** coat the sides and base of rock pools, they are hard to touch and look more like paint than seaweed. These are the calcareous 'lime' algae, the lime rich tissues are pretty disgusting to eat which is pretty handy considering that so many of the shore critters are vegetarian.



### Coralline weed

is another calcareous algae, it forms pink bush like growths that look like miniature coral. The little branches are so heavily impregnate with lime that they snap off when handled.

**Snakeslock anemone** Have long brown or green tentacles - coloured by algae living within the tissues, in bright sunshine the algae will provide food for the anemone. Unlike other anemones it can't withdraw its tentacles therefore is always found in pools on the shore.

### Gem anemone

look like miniature urchins when their tentacles are withdrawn and are often camouflaged in the Coralline weed.

### Thong or Bootlace weed

are often seen as a small 2cm button or mushroom, this is just the 1st year of growth. In the 2<sup>nd</sup> year a branching frond grows from the centre that can reach 1m in length

**SEAWEEDS** dry out quickly and are easily battered of the rocks by wave action. Additionally they can't support themselves and can't feed unless covered by water - it is no wonder that weeds are mainly found in the lower shore or in rock pools. Weeds are very important to the critters on the shore as they provide them with both food and protection.

Seaweeds are useful to us too. Kelp stipes (stems) is the main source of alginates, a natural product that is an emulsifier, gelling agent and stabiliser. Alginates are used widely in the pharmaceutical and cosmetic industries; each year 40,000 tonnes of alginates are produced from UK, France, Norway, California, Japan and China.

In cosmetics they form a base for creams, gels, hair styling foam, shaving foam, toothpaste and barrier cream for babies bottoms.

... **Did you know** that the head on a pint of beer is held there by the extract of seaweed?? And ice cream is thickened by guess what? Yes seaweed!

Red seaweeds produce substances called hydrocolloids

Anyone got suntan lotion on - ooh you've rubbed seaweed into your face!!! Red seaweed thickens sunscreen lotion.

Who uses deodorant sticks? - The texture and thickness of this too is all because of red seaweeds.

## SEX ON THE SHORE

**PLANKTON BABIES** **Investment in numbers!** As plankton larva there is a 99.9 percent chance that you will be eaten or die. Therefore massive numbers of eggs and gametes are spawned to ensure that some will reach adulthood and settle on a shore.

**Barnacles** have the problem of being stuck to the rock; this makes sex a bit tricky. They have solved this by carrying around a telescopic willy proportionally the length of Nelsons column - impressive! So that they can reach another barnacle. In addition barnacles are boys and girls at the same time! Technically known as 'simultaneous hermaphrodites'.



**Limpets** are born neuter i.e. Not boys or girls, after a couple of years they all change into boys, then after around 5 years around a third of the boys change into girls! In the autumn the boy and girl limpets get a bit excited and spawn gametes into the sea where it mixes and hopefully fertilises producing limpet plankton which will eventually settle on a shore.

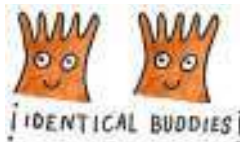
**Crabs** are separate sexes (phew!) that mate, the female carries 800,000 eggs under the abdomen! Lava hatch out live as crab plankton. Baby crabs feed and mature on the lower shore then move down to deeper waters, as they become adults.

### REAL SEX!



**Winkles** are neatly divided into boys and girls. Rough winkles and small winkles copulate and retain the eggs to hatch inside the body producing baby winkles. All very normal really.

**Dog whelks** congregate in spring near the bottom of the shore for what amounts to a massive orgy. The boys wave around their impressive organs (positioned just behind the right side of the head - giving them the nick name Richard Head) driving the girls wild and copulating. The girls sneak into a crevice and lay a load of creamy capsule eggs and return to the orgy. Most of the eggs are infertile, but a few baby dogwhelks will hatch which then eat the infertile eggs.



**Anemones** reproduce both asexually and sexually! Asexually by dividing (budding) in two, producing identical individuals. Sexually, where sperm are released by the boys into the water, which swim and internally fertilise the girls. She eventually releases minute sea anemones.

**Blennies** spawn mid-summer when numbers of bright amber-coloured eggs are laid in shelter under rocks or in crevices. The male changes colour to sooty black except for prominent whitish lip, looking very ferocious he stands guard over the eggs until the baby blennies hatch.



## OUT AT SEA

**Plankton** consists of plants and animals in the sea that have only a limited means of propulsion and move about at the whims of the currents and wind. Most are microscopic but some like the **JELLYFISH** can grow up to 1m across.

**GENTLE JELLYS:** The Moon jellyfish (up to 40cm diameter, transparent with 4 purple gonad rings) and the Barrel or Root jellyfish (up to 1m diameter, solid rubber cream bell with frilly purple tentacles)  
**DO NOT STING**



**BEWARE OF THE STINGERS:** The Compass jellyfish with a distinctive 'compass' on the dome along with the orange Lions mane jellyfish and the Blue jellyfish with their long trailing tentacles **CAN INFLICT PAINFUL STINGS.**

'**PLANKTON SOUP**' is a very important source of food for many marine creatures including the largest whales sharks, turtles and bony fish in the world. Summer blooms of plankton and jellyfish in UK waters attract other **SUMMER VISITORS** to our coast.

**Basking shark** *L: Cetorhinus maximus* Other names: *the bone shark, the elephant shark, the sailfish shark, and the big mouth shark.*

### **DID YOU KNOW?**

**The biggest fish in UK waters** and the 2<sup>nd</sup> biggest in the world!  
11m (36ft) sharks are not uncommon, as long as a London bus, 4-6m sharks are most common in British waters.



**Harmless shark:** Using gill rakers they filter plankton from the sea - they filter 1-2000 cubic metres of seawater every hour (equivalent to an Olympic size swimming pool).

**Worldwide:** They have been reported in all the oceans of the world.

**Social groups:** They travel alone, in pairs, or in schools of up to 100 members.

**Threats:** They were hunted for their livers (approx one third of their body weight) which contain oil used in the cosmetic industry. They are still killed for their fins for the Far East 'shark fin soup' market. In some areas they have been hunted to extinction.

**UK Protection:** Full protection from intentional capture or disturbance in British waters (to 12 miles offshore) under a 1998 listing on the Wildlife and Countryside Act (1981)

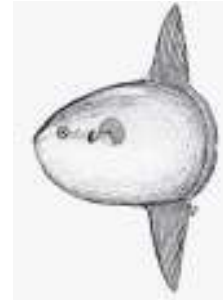
Text by Kate Lock, illustrations by Ben Sutcliffe, photo by Skomer Marine Nature Reserve.

## **Giant Ocean Sunfish** L: *Mola mola* meaning Millstone

Often their tall dorsal fin flapping to and fro on the water surface is mistaken for sharks.

### **DID YOU KNOW?**

**Biggest 'bony' fish in the world:** They can grow to 3m (10ft) and may weigh up to 1500kg (3300lb). Their almost circular shape is the opposite to torpedo shaped fish usually found in the open ocean. They are silver coloured with a rough sandpapery skin covered in thick slimy mucous.



**Parasite Heaven:** 40 different parasites have been found on sunfish, to clean themselves they recruit small fish found under drift kelp and flotsam that pick off the parasites and get a free dinner!

**Jellyfish dinner:** Top of the menu is jellyfish plankton with the occasional small fish.

**Sunbathing and deep diving:** At night sunfish dive deep to around 60m following the migration of plankton and jellyfish to the twilight zone. It is claimed that their surface behaviour during the day of 'basking in the sun' is in order to thermally recharge after the deep cold dives.

**Distribution:** They are found in all tropical and temperate oceans. Sunfish don't make large-scale migrations but are found around blooms of jellyfish.

**Investment in numbers:** A female may carry more than 300 million eggs in her single ovary.

**Threats:** Sunfish are eaten throughout Asia, in Taiwan, the gut is served as 'Dragon intestines'. They are a common by-catch in driftnet fisheries, comprising as much as 90% of the driftnet swordfish fishery in Spain.

## **Leatherback turtle** L: *Dermochelys coriacea*

### **DID YOU KNOW?**

**World's largest** species of marine turtle and the most widely distributed reptile in the world. The black leathery skin, large size and prominent ridges on the back make them easy to identify.



**World record in Wales:** the largest specimen ever recorded was found stranded at

Harlech, Wales in 1988. The turtle weighed 916 kg and was 2.91m long.

**From the tropics to the UK:** They nest on tropical beaches and feed on jellyfish in tropical, sub-tropical and temperate waters. They can maintain some control of their body temperature and can therefore remain active and feed in cooler waters. The adults are regular migratory visitors to the coastal waters around the UK.

**Hard shelled turtles** that have been recorded in the UK are juvenile or sub-adult loggerhead and Kemp Ridley turtles washed up on shores as 'cold stunned' strays, having been blown from warmer climates into our waters. Green and hawksbill turtles have only seldom been recorded.