



LORNE GILL/SNH

SEATON CLIFFS, ANGUS

DEFINITION

Seacliffs form at the junction between the land and the sea where slippage or erosion by the sea causes a break in slope. Gradient varies between 15° and vertical, and in height and geology. Hard rock cliffs are eroded slowly by the sea and are often near vertical, accumulating soil and supporting vegetation on ledges. Soft rock cliffs are more unstable and often form a vegetated coastal slope. The habitat contains an important range of natural features with extensive areas of natural and semi-natural vegetation types - hard cliff with rock face vegetation, cliff crevice and cave, rock exposures, coastal boulders, boulder clay cliffs, scree and vegetated undercliff.

KEY SITES

There are two main areas of maritime cliff and slope in Tayside. Both of these areas are largely designated sites:

- Whiting Ness (next to Victoria Park in Arbroath) to Ethie Haven – most of this is covered by Whiting Ness to Ethie Haven SSSI.
- Rickle Craig (at the north end of Lunan Bay) to Scurdie Ness (just south of Montrose at Ferryden) which is all designated as an SSSI.

CURRENT STATUS AND EXTENT OF HABITAT

Over 50% of the cliffs in Britain are found in Scotland, but Tayside has less than 1% of the Scottish total. More than half the Tayside coast is fringed by sandy beaches with only two significant lengths of rock or degraded boulder clay cliffs between Arbroath and Ethie Haven and between the South River Esk and Lunan Bay.

The high diversity of species and plant communities relates to the considerable habitat diversity and to the action and interaction of various ecological gradients. These include variation in geology and soil types, influence of salt spray and degree of exposure (including effects of wind), aspect (duration of exposure to sunlight), grazing intensity and fertilizer inputs from adjacent farmland. The sandstone cliffs of the Angus coast are relatively resistant to wave action, but erosion in places may inhibit the establishment of some vegetation types, whilst other plants are especially adapted to this environment. This erosion also makes the area more interesting geologically.

Main Areas of Habitat in Tayside

The two main areas of maritime cliff and slope in Tayside are both designated as Sites of Special Scientific Interest and are therefore fairly well documented.

Whiting Ness to Ethie Haven

This is the longest continuous stretch of sea cliffs and rocky shore in Tayside. Up to 50m high and stretching about 11 km along the coast, the terrain is very dangerous in places and many parts are inaccessible. The site covers the cliffs and immediate hinterland from Whiting Ness to Meg's Craig just south of Auchmithie, and the cliffs and hinterland from Rumness, north of Auchmithie to Corbie Knowe on the southern edge of Lunan Bay. The cliffs are widely studied as they show a spectacular series of erosion features including sea stacks, blowholes, caves, wave cut platforms and arches. Carlingheugh Bay has a raised beach and relic sea cliff thought to date from the main postglacial transgression approximately 6,000 years ago. This part of the Angus coast is a well-known site for migrating birds in autumn and winter.

- The site is a SSSI because of its unimproved coastal grassland and large numbers of coastal breeding and wintering birds, as well as for its geological interest. Plants include Long-bracted sedge *Carex hostiana*, Maiden pink *Dianthus armeria*, Clustered bellflower *Campanula glomerata*, and Hairy Violet *Viola hirta* and cliff vegetation such as Sea spleenwort *Asplenium marinum* and Pellitory-of-the-Wall *parietaria diffusa*, together with some rare and unusual mosses and liverworts. The site contains the largest breeding seabird colony in Angus with nationally important numbers of overwintering Turnstone *Arenaria interpres* and Purple Sandpiper *Calidris maritima* feeding and roosting on the flat, rocky shoreline. Also present are Kittiwakes *Rissa tridactyla*, Herring Gulls *Larus argentatus*, Fulmars *Fulmarus glacialis*, Puffins *Fratercula arctica*, Guillemots *Uria aalge* and Razorbills *Alca torda*. Moth and butterfly species include Grayling *Hipparchia semele* and Small pearl-bordered fritillary *Boloria selene*, as well as the nationally rare Small blue butterfly *Cupido minimus*. Rare snails and beetles are also present.
- The Scottish Wildlife Trust's Seaton Cliffs Reserve lies at the south end of the SSSI. At 12.1 hectares, it is 8% of the total SSSI.
- Two Geological Conservation Review (GCR) sites within the SSSI have been notified. The first of these is Whiting Ness where the exposures of the irregular unconformity between the Upper Old Red Sandstone and the Lower Old Red Sandstone demonstrate that the stratigraphy of the Midland Valley Devonian consists of two separate episodes of sedimentation with a sedimentary break between, the entire Middle Devonian being absent. Secondly, fine coastal exposures of the Ethie Lavas between Black Rock and East Comb show margins that are commonly pillowed and characterised by complex lava/sediment relationships suggesting extrusion of lava onto wet sediment. This site has important research potential for studies on Lower Devonian volcanic environments.
- The Tayside RIGS Group has named the area from Whiting Ness to Carlingheugh Bay a Regionally Important Geological Site (RIGS).

As well as the cliffs' natural heritage and geological interests, there are a number of ancient forts and castles designated by Historic Scotland. There is also a rich history associated with the cliffs between Whiting Ness and Ethie Haven from Bronze and Iron Age occupation of some of the caves and Maiden Castle to use of the caves at Dickmonts Den by smugglers and wreckers. Places and events associated with the area were used by Sir Walter Scott who described the shipwreck of January 1800 in 'The Antiquary' and renamed Auchmithie as "Musselcraig", home of the "Mucklebacks".

Maritime Cliff and Slope

CE2

Rickle Craig to Scurdie Ness

Scurdie Ness to Boddin Point is a continuous length of rocky shore approximately 4km long.

- This rocky stretch of coastline was selected as an SSSI for its geological interest and uncommon species-rich grassland types reflecting the base-rich nature of the underlying rock - notably on and around the old lime kiln on Boddin Point - and on the more friable volcanic rocks. Characteristic plants include the scarce Nottingham catchfly *Silene nutans*, as well as Kidney vetch *Anthyllis vulneraria*, Clustered bellflower *Campanula glomerata*, Fairy flax *Linum catharticum*, Carline thistle *Carlina vulgaris* and Burnet saxifrage *Pimpinella saxifraga*. Small areas of 'perched' saltmarsh are found around the high water line. Over 30 species of snails are known owing to the rich vegetation.
- There are two Geological Conservation Review (GCR) sites within the SSSI. Scurdie Ness to Usan Harbour provides the best section in Scotland through Old Red Sandstone lavas and associated sedimentary rocks of the Montrose Volcanic Formation. These rocks were formed about 410 million years ago with lavas being erupted from a volcano to the north-east (the Montrose volcanic centre). During periods of non-volcanic activity sediments containing pebbles of volcanic rock collected in lakes and rivers flowing over the lavas. After the lavas had been erupted fluids flowing through the rocks deposited silica in cavities, forming agates. The area around Scurdie Ness is a GCR site in its own right for its mineralogy because of the presence of these agates, some of which are gem quality, within the lavas.

KEY SPECIES

P = UK Priority species C = UK species of conservation concern

Birds	Shag	<i>Phalacrocorax aristotelis</i>	C
	Herring gull	<i>Larus argentatus</i>	C
	Turnstone	<i>Arenaria interpres</i>	C
	Purple sandpiper	<i>Calidris maritima</i>	C
	Kittiwake	<i>Rissa tridactyla</i>	C
	Fulmar	<i>Fulmarus glacialis</i>	
	Rzorbill	<i>Alca torda</i>	C
	Puffin	<i>Fratercula arctica</i>	C
	Guillemot	<i>Uria aalge</i>	C
Invertebrates	Small blue butterfly	<i>Cupido minimus</i>	C
	Small pearl-bordered fritillary	<i>Boloria selene</i>	C
Higher Plants	Kidney vetch	<i>Anthyllis vulneraria</i>	
	Pellitory-of-the-wall	<i>Parietaria judaica</i>	
	Maiden pink	<i>Dianthus deltooides</i>	
	Nottingham Catchfly	<i>Silene nutans</i>	
Lower Plants	Moss and liverwort spp.		C

NATURE CONSERVATION IMPORTANCE

Mammals

Bat species may use the caves and clefts for roosting, breeding and hibernating.

Tayside Biodiversity Partnership



Birds

Sea Birds

The Angus coast contains important habitats for breeding sea birds and is renowned for attracting migrating birds in autumn and winter.

The cliffs support large breeding colonies of Puffin, Razorbill, Herring gull and Shag. Razorbill, Guillemot and Puffin are auks that are mainly summer visitors, although a small number remain through the winter. However, Puffins are far less commonly encountered in the winter than other auk species. The Shag and Herring gull are common visitors to the area and nest on cliffs between Arbroath and St. Cyrus. Fulmars also breed in abundance along the rocky cliffs.

The area supports Turnstones which are noisy shorebirds equipped with a stout pointed bill ideal for turning over stones in the search for food. They winter along rocky coasts and generally breed on the rocky ground of coastal islands in Arctic regions.

Kittiwakes are common summer visitors to their nesting sites on the sheer cliffs between Arbroath and Scurdie Ness; large numbers are also seen at the mouth of the River North Esk where they bathe in the fresh water. They are less commonly seen in winter. Tiny numbers of Purple sandpiper also winter in the inter-tidal zone of rock coast.



PUFFIN

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KITTIWAKES

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Higher plants and vegetation

The largely south-easterly facing cliff and slope areas of the Angus coastline comprise a diversity of environments. These support some very diverse habitats from exposed hard rock communities with rock face vegetation to softer rock cliffs, cliff crevice and cave, from rock exposures and coastal boulders to scree and vegetated undercliff.

Nottingham Catchfly

Nottingham Catchfly *Silene nutans* is a perennial plant with drooping creamy-white flowers that have rolled back. Some populations have flowers that are yellow or pink-tipped. The deeply cleft petals open fragrantly at night. Its leaves have downy undersides and sticky upper surfaces. Specimens grow to a height of 25 - 80 cm. It has a very scattered distribution within Britain, but is locally common from North Britain to Wales. It is found in the North East of Scotland and grows locally in Angus where it favours grassy, base-rich sea cliff habitats.



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NOTTINGHAM CATCHFLY

Invertebrates

Important populations of Small blue butterfly, Grayling and Small pearl-bordered fritillary *Boloria selene* are found among the cliff-top grassland of the Arbroath cliffs. The area is also important for its snails and beetles.

NATIONAL BIODIVERSITY CONTEXT

There is a UK Habitat Statement for Maritime Cliff and Slope which has the following main objective:

Maintain and manage in a natural state, taking into account the great range of variation in habitat, hard rock cliffs and extensive soft rock cliff systems, whilst taking into consideration the need for any essential coastal defence works.

Measures to be considered further include:

- Evaluate the existing measures for conserving and managing maritime cliff and slope and the habitats it supports
- Protect cliff habitats of conservation importance from inappropriate uses or impacts
- Implement strategies for managing the coastal zone at local, regional and national levels
- Review the powers and duties of coastal authorities for safeguarding this habitat
- Encourage further survey work and research into the ecology of this habitat type

ECOLOGY AND MANAGEMENT

Whiting Ness to Ethie Haven

It is probable that most of the cliffs were grazed in the late 1800s, though there has been no grazing since World War II - with the exception of Ethie Mains where Soay sheep graze the grassy slopes.

The Scottish Wildlife Trust manages part of the site's southern section as a Nature Reserve. Its nature trail is open to the public and is especially popular for informal recreation.

SNH has carried out a detailed vegetation survey and will use the information to help in the management of the site over the next few years. The site's cliff vegetation was monitored by SNH in 2000. This confirmed that there has been some increase in coarser, more dominant grasses. This may arise from the use of pesticides, herbicides or fertilisers from fields adjacent to the SSSI at the cliff edge and run-off of fertilisers in gullies and field drains passing through the SSSI. Vegetational changes will continue to be monitored using the baseline study for comparison.

Case Study

Soay sheep

Soay sheep are a small hardy breed originally from the Hebrides. They are dark brown with a white belly. A flock of them has long grazed both the cliffs and the shore at Ethie Mains on the Angus cliffs.

Walkers have noted that the sheep help control the level of scrub, including brambles, on the cliff top thus enhancing accessibility. The sheep are contained by freestanding electric fences. Grazing Animal Projects such as this are not suitable for all sections of the cliff tops as they would generate extra work for arable farmers, but grazing with traditional breeds is acknowledged as one of the management methods gaining popularity to enhance biodiversity.



KEN WILSON

Rickle Craig to Scurdie Ness

Grazing takes place in the fields adjacent to the shoreline with cattle free to go onto the shore and hence also the SSSI. Some cliff stabilisation has been done in the past and there is also a harbour and basic sea defences within the site. Gem collecting is still common here, but was especially so in the 1970s and 1980s. There has also previously been some dumping and vegetation burning.

The site was Site Condition Monitored in 2000 as part of an SNH 6-year programme. A full survey of the habitat is required in order to set up effective area-wide monitoring and assessment in the future.

CURRENT FACTORS CAUSING LOSS OR DECLINE

The nature of the cliffs in Tayside has ensured that they remain amongst the least modified of terrestrial habitats. There are, however, several factors affecting them:

Coastal protection work

- Coastal protection structures at the base of cliffs are rare in Tayside and therefore natural erosion is the main influence upon the physical structure of the cliffs. Coastal protection works are designed to prevent the removal of eroded material by the sea. Their erection would therefore be likely to be detrimental to the plant and invertebrate communities dependent upon the unstable surface, as well as obscuring important rock exposures.

Maritime Cliff and Slope

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Agriculture

- Cultivation of the cliff top vegetation has truncated the natural zonation between maritime and terrestrial vegetation resulting in some loss of plant species diversity as well as the loss of large areas of cliff top vegetation.
- As well as a loss of area due to agriculture, spray drift and run-off of pesticides, herbicides or fertilisers from adjacent fields can also affect cliff-top vegetation communities which can lead to a loss of species diversity.
- Cultivation close to the cliff edge could potentially lead to increasing erosion and slippage on the cliff tops.
- Although grazing by rabbits is an obvious feature in places along the coastal cliffs and slopes, a general lack of grazing has caused some scrub encroachment and a loss of some comparatively coarse and species-poor maritime grassland communities. Whilst some scrub (for example small areas of hawthorn, bramble or gorse scrub) can add to habitat diversity and is of value for many bird species, the diversity of species and vegetation types is generally enhanced by the right level of grazing.
- Tipping and dumping occurs in places along the coast. Locally this activity can have a profound impact on the flora and bird life. Maritime grassland is vulnerable and where large quantities of earth have been dumped succession is likely to occur to other vegetation types supporting tall bulky grasses and nettles.

Recreation

- The cliffs are popular for their scenic value, rich history and culture and many cliff-top footpaths are heavily used. Unless well managed, vegetation trampling can reduce plant species diversity and the creation of access paths from cliff top locations to the shoreline can increase erosion and may adversely affect nesting birds.
- The southern area of cliffs comes under the heaviest recreational pressure because of its proximity to Arbroath, the existence of footpaths, including a nature trail (within the SWT Reserve) and the suitability of the site for walking, jogging, mountain biking, bird watching, botanising and angling. The northern section is notably less used. Litter is a continual problem creating a potential hazard for seabirds, invertebrates and small mammals. Angus Council is currently considering the possibility of a coastal trail which would run through the whole site; this could considerably increase the number of walkers within the SSSI.
- Burning by vandals regularly occurs between Whiting Ness and Carlingheugh Bay, especially in areas of thick grass or gorse and has resulted in the loss of an important plant species, the Maiden pink *Dianthus armeria*. Some of the burns have been so hot that loss of the humus part of the soil has occurred thus leaving areas highly prone to erosion, especially on slopes. Small blue butterflies *Cupido minimus* are dependent upon Kidney vetch *Anthyllis vulneraria* as a larval food plant so if fires should occur on a site on which it is present - or other rare species are known to occur - local populations could be lost.
- Theft of plants often occurs when Thrift *Armeria maritime*, Campion *Silene spp.* and other plants are in flower. SWT volunteer wardens stopped two people in 1993 which resulted in one of the individuals being charged. Theft of Herring gull eggs is also known to take place. There have also been incidents concerning the shooting of seabirds. There is currently no volunteer warden.

- In the 1980s the area between Whiting Ness and Carlingheugh Bay was used by off-road motorcyclists which resulted in unsightly tracks, damage to vegetation, erosion and noise pollution. Barriers now discourage motorcyclists, but there are sporadic incidents around Carlingheugh Bay.
- Angus College, Abertay University and Dundee University, as well as local schools, all use the Seaton Cliffs SWT Reserve as part of their ecological and geological courses. SWT Project and Training teams have also used the Reserve for training purposes.

Natural impacts

- Natural slumping and erosion occurs throughout the site, especially areas of softer rock. However, the geological interest of the site is well exposed and is not threatened in any way with erosion providing fresh exposures.

MAIN THREATS TO KEY SPECIES

Long-bracted sedge, Kidney vetch, Pellitory- of-the-Wall, Maiden Pink	- Recreational erosion - Trampling - Fire and theft	
	UK Importance of Tayside populations:	unknown
Shag, Herring gull, Turnstones, Kittiwakes, Fulmars, Razorbill, Purple Sandpipers, Puffin, Guillemots	- Litter - Disturbance, including dogs - Theft of herring gull eggs is known to take place	
	UK Importance of Tayside populations:	moderate
Small blue butterfly	Fires occurring in areas of Kidney vetch could result in populations being lost	
	UK Importance of Tayside population:	moderate

OPPORTUNITIES AND CURRENT ACTION

- Management plans for all designated sites to be kept current.
- Site Condition Monitoring programme being carried out by SNH monitors all SSSI notified interests on a 6-yearly basis. This could potentially be supplemented in between by work by other organisations.
- A Shoreline Management Plan is being prepared by Angus Council with input from other bodies.
- Integrated Coastal Zone Management is being considered by the Tay Estuary Forum; this would bring together the Shoreline Management Plan and the Tayside Biodiversity Action Plan.
- The Scottish Wildlife Trust's Seaton Cliffs has a reserve management group on which SNH is represented owing to the site's status as a SSSI.

Maritime Cliff and Slope

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OBJECTIVES AND TARGETS

Objectives		Targets
1	Protect Tayside's existing maritime cliff and slope resource and the variety of habitats present from further losses to anthropogenic factors; to ensure conditions are suitable for the variety of species found within the habitat, especially the breeding and wintering birds and rare invertebrates, allowing for natural processes and replacing deterioration with positive conservation.	No net loss in area or reduction of quality of habitat (except from natural erosion).
2	Where conditions allow manage the coast in sympathy with natural processes, allowing cliffs to function as part of the natural coastal defences.	Allow the natural functioning of the coast where possible.
3	Continue to determine in detail the area, extent and condition of maritime cliff and slope habitats in Tayside.	Complete survey of all maritime cliff and slope habitat by 2004.
4	Maintain and protect the quality and integrity of designated sites. Ensure that the current set of management plans is completed and that monitoring of sites continues. Seek to apply prescriptions and principles to all maritime cliff and slope habitats in the region.	Keep up-to-date management plans for all designated areas.
5	Set up a five-year programme to raise awareness of biodiversity, its importance, the fragility of the coast, and the need for its conservation in Tayside. Include maritime cliff and slope in this programme.	Set up a public awareness programme by 2002. Run public awareness programme until 2006.
6	Ensure that any work carried out is in accordance with the aims and objectives of the Tay Estuary Forum and the Angus Shoreline Management plan.	Continue liaison with Angus Council Roads Department and Tay Estuary Forum.

Stakeholders

- Landowners, land managers and advisors, developers, tourists, and local users.

ACTION FOR BIODIVERSITY

		Action - Maritime Cliff and Slope	Deliverers		To take place by							Meets Objective No.	
			Lead Partners	Partners	02	03	04	05	06	07	11	16	
LBAP Ref.	A	Policy and legislation											
CE2	1	Contribute to the development of Angus Council's Shoreline Management Plans and land use planning policies to preventing any further loss of natural cliff and slope habitats.	AC	TBP	#	#							1
CE2	2	Assist Tay Estuary Forum in the development of an Integrated Coastal Zone Management plan.	TEF	TBP				#	#				
CE2	3	Encourage the use of policies to safeguard existing cliff and slope habitats when Structure and Local Plans are reviewed.	DCC AC	SNH FC TBP	#	#	#	#	#	#	#	#	1

Tayside Biodiversity Partnership

CE2	4	Develop/promote agri-environment schemes which will encourage restoration and sustainable management of cliff top habitats.	FWAG SAC	SNH	# # #	1,2,3
	B	Site management				
CE2	1	Consider system of wildlife sites.	SWT		# # # # # # # #	1,2
CE2	2	Use positive management agreements where appropriate to encourage sustainable grazing on cliff and slope SSSI and others where possible.	FWAG SEERAD	SNH	# # # # # #	1,2,3
	C	Species management				
CE2	1	Promote volunteer wardening of cliff tops.	SWT	TBP	# #	1,5
	D	Advisory				
	E	Research and monitoring				
CE2	1	Site Condition Monitoring of Whiting Ness to Ethie Haven and Rickle Craig to Scurdie Ness on 6 year cycle.	SNH		# # # # # # # #	4
CE2	2	Maritime Cliff and Slope Action Plan review process– ensure this plan is being delivered annually and in detail after 5 years.	TBP		# # # # # # # #	All
	F	Promotion and awareness-raising				
CE2	1	Raise public awareness of the importance of cliff and slope habitats through guided walks, talks, publications, press releases and environmental education opportunities.	TBP	SWT, AC, FE SNH, REEF	# # # # # # # #	6

Maritime Cliff and Slope

This illustrative map shows a few key examples of the habitat. Please note that many sites of interest are privately owned and owners' permission should be sought for any access.

