ELC_30: Aberlady Bay

Site information

Location and summary description:

Aberlady Bay comprises a varied assemblage of coastal landforms located north of the village of Aberlady. It includes sand dunes, salt marsh, extensive intertidal flats, an active sand spit and raised shorelines.

National Grid reference:

Mid-point: [NT 46004 81262]

Site ownership: Mostly Local Nature Reserve (East Lothian Council); part owned by local golf courses

Site type: Natural landform; Natural view

Current use: Open country, recreation

Field surveyors: John Gordon

Current geological designations: Part of Firth of Forth SSSI

Date visited: 5 November 2014

Other designations: Firth of Forth SPA and Ramsar site, Aberlady Bay Local Nature Reserve

Site map

(Figure 35) Aberlady Bay Map. The site boundary has been drawn to include the dominant intertidal portion of Aberlady Bay including sand flats, and the dune system. The site boundary is largely coincident with that of the Aberlady Bay Local Nature Reserve. The neighbouring bedrock/Quaternary ELC Geodiversity sites ((ELC_13), Gullane and (ELC_14), Kilspindie Shore) are included for reference, along with the geomorphological Gullane Bents (ELC_29) site, shown as transparent greyed out areas.

Site description

Background

The site comprises an area of sand dunes, salt marsh, intertidal sand and mud flats, an actively forming sand spit and raised shorelines (ELC_30_P1). Different aspects of the geomorphology and coastal evolution are described by Smith (1972), Rose (1989), Firth et al (1997), Kirby (1997) and Babtie Group ABP Research & Consultancy Ltd. (2002).

Quaternary deposits and landforms

Several relict erosional coastal features occur within the site. Kirby (1997) identified fragments of two raised shore platforms at Gullane Point, while Smith (1972) described a buried planated till surface at 1.8 m OD between the village of Aberlady and the footbridge at the entrance to the Local Nature Reserve. Intertidal shore platforms are present at Gullane Point and Aberlady Point, planed across a variety of dipping Carboniferous strata. Glacial erratic blocks are present on their surface (ELC_30_P2).

Smith (1972) identified two raised Holocene shorelines at 8–9 m OD and 6–7 m OD on the southern flank of Gullane Hill within Luffness Links Golf Course (ELC_30_P3). From radiocarbon dates on peat, Smith concluded that all the deposits

below 6 m OD formed in the last c. 2500 years.

Running south from Gullane Point, a succession of dune ridges and intervening dune slacks form part of a prograding coastal foreland that has built westwards during the late Holocene from the lower slopes of Gullane Hill (Rose, 1980; (ELC_30_P4)). According to Kirby (1997), a series of five sand spits formed south of Gullane Point, with dunes subsequently accumulating on their surfaces under conditions of abundant sediment supply. The present sand spit is the latest in the sequence reflecting a net southward movement of sand that has also diverted the Peffer Burn southwards. Analysis of coastal changes on Ordnance Survey maps indicates that much of the shoreline of Aberlady Bay underwent accretion between 1907 and 1999 (Babtie Group ABP Research & Consultancy Ltd, 2002). The present coastal dune edge along the beach south of Gullane Point is vegetated but relatively steep-fronted, suggesting wave erosion at the base (ELC_30_P5).

Aberlady Bay itself is a large sediment sink with extensive intertidal sand and mudflats fringed by salt marshes (ELC_30_P6), (ELC_30_P7). As noted by Firth et al. (1997), those on the southern margins of the bay are fronted by a small cliff and undergoing erosion (ELC_30_P6).

There are close associations between the different landforms, vegetation and the diversity of physical features which provide the basis for a range of habitats and vegetation communities (Kirby, 1997). The salt marsh and intertidal flats also form important wintering grounds for geese.

Assessment of site: access and safety

Road access and parking Access is from the A198 coastal road east from Edinburgh at Aberlady.

There is a public car park and toilets 500 m east of the village and a footbridge across the Peffer Burn at the entrance to the Local Nature Reserve. Access to the southern shore of the bay can be gained by walking along the road from Aberlady to Kilspindie Golf Course. The site can also be accessed by walking along the coast from Gullane.

Safety of access No additional precautions beyond those normally associated with visiting a beach and dunes. Visitors should be aware of incoming tides if accessing the sand spit and intertidal flats.

Safety of exposure The tide rapidly rises in the intertidal flats and visitors should be aware of tide times.

Access There is good access on footpaths from the public car park 500m east of Aberlady. Part of the site lies within a golf course adjacent to the Local Nature Reserve.

Current condition The condition is good.

Current conflicting activities None known.

Restricting conditions The active sand spit and intertidal areas are covered at high tide.

Seasonal access restrictions may apply over parts of the Local Nature Reserve during the bird breeding season.

Nature of exposure Coastal

Assessment of site: culture, heritage & economic value

Historic, archaeological & literary associations Not known

Aesthetic landscape Coastal landscape

History of earth sciences The John Muir Way passes through part of the site

Economic geology Not known

Assessment of site: geoscientific merit

	Rarity	Quality	Literature/collections	Primary interest
Lithostratigraphy				
Sedimentology				
Igneous/mineral/metamorphic geology				
Structural geology				
Palaeontology				
Geomorphology	Regional	Good/Excellent	Smith (1972), Rose (1980), Firth et al (1997), Kirby (1997), Babtie Group ABP (2002)	X

Site geoscientific value

Aberlady Bay displays a good range of coastal landforms and sedimentary environments that demonstrate coastal evolution, particularly during the latter part of the Holocene. There is significant potential for research on coastal processes and coastal evolution, as well as education and public interpretation on coastal dynamics and the links between geodiversity and biodiversity.

Aberlady Bay is an excellent example of an assemblage of depositional coastal landforms and sedimentary environments with regional significance.

Assessment of site: current site usage

Community The beach and dunes within the Local Nature Reserve are heavily used for recreation, including walking and bird watching. The area includes parts of the Luffness Links and Gullane Links golf courses.

Education There is significant potential for education and public interpretation on coastal dynamics and evolution.

Assessment of site: fragility and potential use of the site

Fragility Trampling, off-road vehicle use, tree planting, tipping and hard engineering responses to coastal erosion; likelihood of development. However the site is carefully managed as a Local Nature Reserve by East Lothian Council. Note that coastal erosion is part of the natural process of coastal evolution.

Potential use School education and public interpretation addressing coastal dynamics and living with a dynamic landscape in the context of climate change and sea-level rise.

Geodiversity summary

The site is a good example of a range of coastal landforms and there is potential for developing its value for research, education and public interpretation through greater promotion of existing information.

Site photos

(ELC_30_P1) View north across Aberlady Bay from Kilspindie on the south shore. © John Gordon.

(ELC_30_P2) Glacial erratic block on an intertidal shore platform near Gullane Point. The platform is cut across dipping Carboniferous strata © John Gordon.

(ELC_30_P3) Raised shorelines at Luffness Links Golf Course © John Gordon.

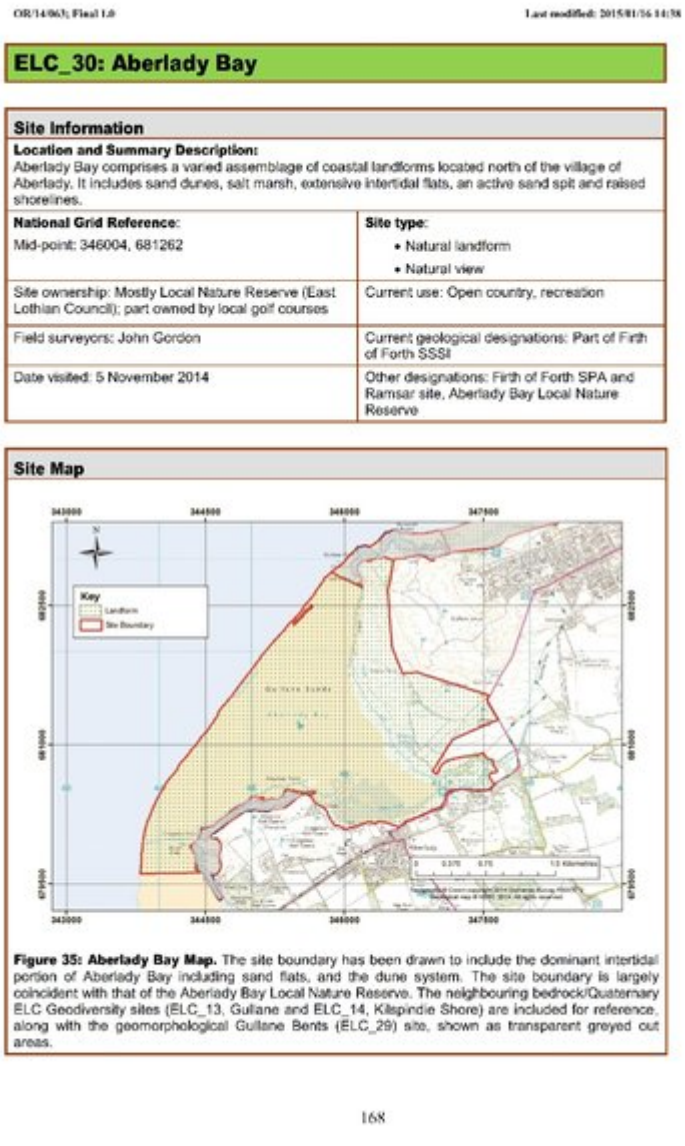
(ELC_30_P4) Sand dune system south of Gullane Point. © John Gordon.

(ELC_30_P5) Steep coastal edge south of Gullane Point. © John Gordon.

(ELC_30_P6) Saltmarsh and intertidal flats near the entrance to the Local Nature Reserve © John Gordon.

(ELC_30_P7) Intertidal flats near the entrance to the Local Nature Reserve © John Gordon.

References



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Site Map

Figure 35: Aberlady Bay Map. The site boundary has been drawn to include the dominant intertidal portion of Aberlady Bay including sand flats, and the dune system. The site boundary is largely coincident with that of the Aberlady Bay Local Nature Reserve. The neighbouring bedrock/Quaternary ELC Geodiversity sites (ELC_13, Gullane and ELC_14, Kilspindie Shore) are included for reference, along with the geomorphological Gullane Bents (ELC_29) site, shown as transparent greyed out areas.

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(ELC_30_P6) Saltmarsh and intertidal flats near the entrance to the Local Nature Reserve © John Gordon.

(ELC_30_P7) Intertidal flats near the entrance to the Local Nature Reserve © John Gordon.