# Habitats Directive

## TWEED ESTUARY

### What's happening?

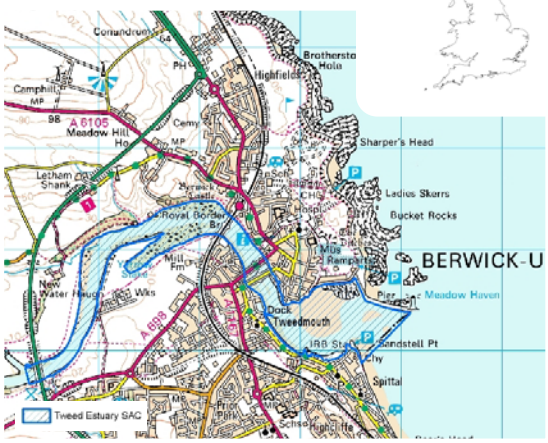
Laws have been introduced under the Habitats Directive to safeguard Europe's most endangered plants, animals and habitats.

As part of this, the Environment Agency has to review all the existing consents that we regulate to ensure there are no adverse effects on the nature conservation interests of designated sites such as Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

We used a staged approach to do this:

- Stages One and Two – listed all consents and looked at those with the potential to have a significant effect.
- Stage Three – looked in detail at whether they have an adverse affect on special sites.
- Stage Four - those consents with no adverse effect will stand and those that do have been examined further to see what can be done about it.

### Location

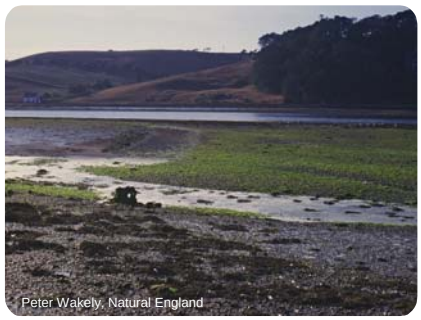





### About this site

The Tweed Estuary is designated as a SAC for the following features:

- estuary
- intertidal mudflats and sandflats
- sea lamprey
- river lamprey



Peter Wakely, Natural England

The Tweed Estuary is a complex estuary, it discharges into the North Sea. It is a long narrow estuary, which is still largely natural and undisturbed. It supports a wide range of habitats compared with other estuaries in north-east England. The SAC covers an area of over 155 hectares.

River and sea lamprey have been recorded throughout the Tweed catchment but neither species have been widely recorded in the estuary and it is thought that these migratory species just pass through the estuary rather than living there.

We identified that a number of consented discharges were likely to have a significant effect on the estuary and the intertidal mudflats and sandflats due to their contribution to nutrient enrichment and toxic contamination. These effects were considered in more detail.

## Nutrient enrichment

Estuaries are typically naturally high in nutrients, but nutrient enrichment has the potential to cause significant adverse effects within an estuarine ecosystem. Excessive inputs of nitrogen and phosphorus from sewage and diffuse inputs, including agricultural run-off, may increase natural levels and lead to excessive growths of algae.

We used a computer to model nutrient levels at the site under a variety of different conditions, the model included nutrients from all sources, not just consented discharges. The modelling results were supported by monitoring information. This showed that although nutrient levels are naturally high in the Tweed Estuary, no adverse effects were noted, this is because tidal flushing reduces nutrient levels in the estuary on every tidal cycle.

### Effects of nutrient enrichment

Nutrients such as phosphorus and nitrogen are needed for plant growth, but excess levels can adversely affect habitats by encouraging the spread or proliferation of opportunistic species such as green algal mats.

Excessive growth of algae can be toxic. They can smother other habitats and can cause oxygen depletion. This may adversely affect the invertebrates that live in the sediments, plants, fish and other animals that live in the estuary by causing changes in the type and productivity of the species present.

## Toxic contamination

The standards for chemicals were not exceeded in the water column, but at some sites the chemicals in the sediment were at levels that could lead to effects on the ecology.

The chemicals in the sediment may be historic because in the past the Tweed Estuary was heavily industrialised and a high degree of pollution occurred. Chemicals may also be from other unregulated sources as well as the inputs regulated by the Environment Agency.

We looked at one consented discharge that may have an adverse effect on the ecology of the estuary due to toxic contamination.

We surveyed the invertebrates that live on or in the sediment and found that they were healthy and showed no significant response to toxic contaminants.

## Final conclusions

We looked at the impact of consented discharges and found that they do not have a significant effect on nutrient availability within the estuary. Although levels of some toxic contaminants were found to be elevated in the sediment, they were below levels associated with adverse biological effects. We concluded that consented discharges do not have an adverse effect on the site.

We will continue to monitor algal coverage and contaminant levels.

**Further information can be found at:**
**www.environment-agency.gov.uk**

**Guidance can be requested from enquiries@environment-agency.gov.uk**