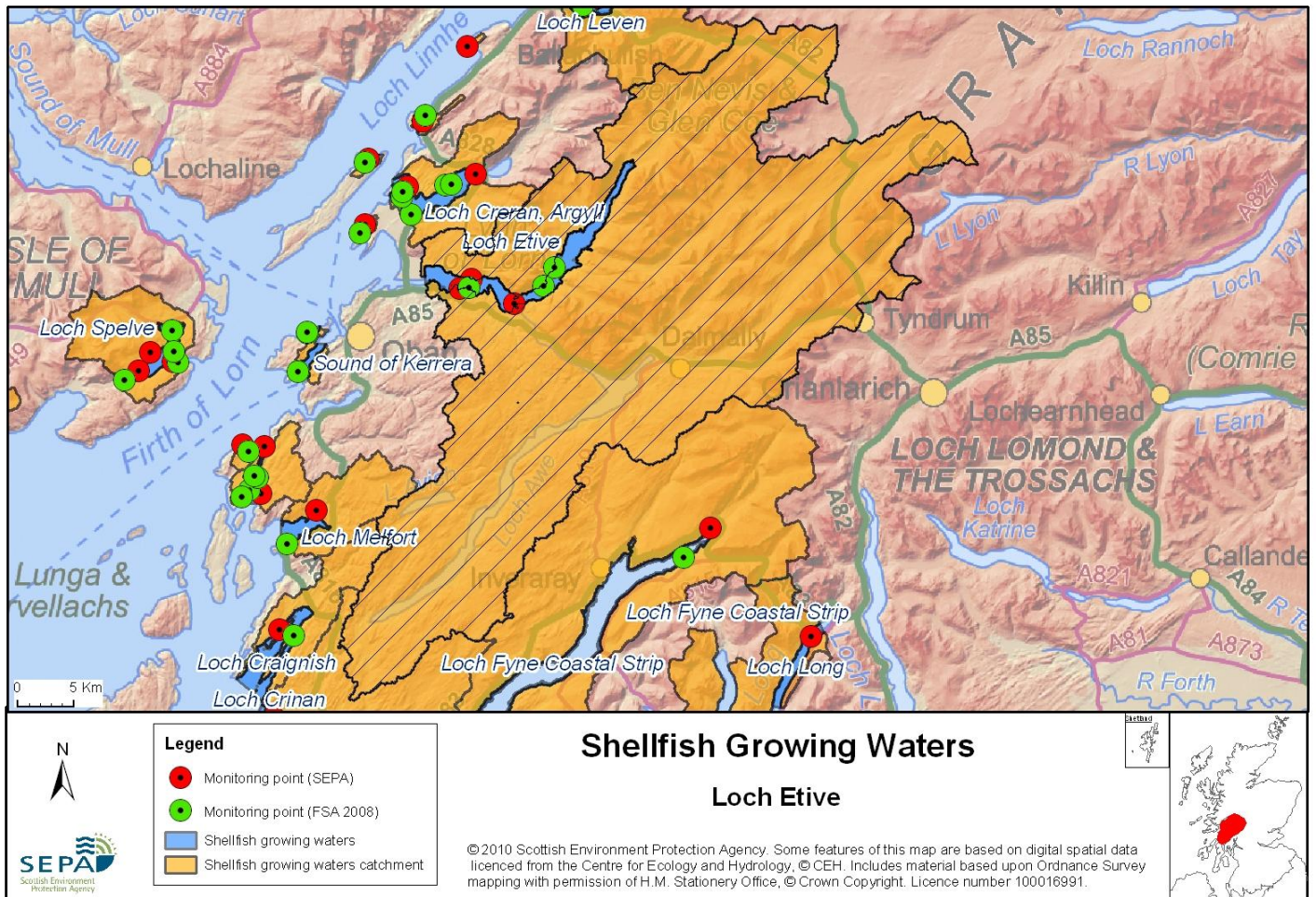


12 Loch Etive



Name	Loch Etive
Report Reference Number	12
WFD Code	UKS7992312
Local Information	An area bounded by a line drawn between the points NM9300035096 and NM9300034365 and extending to MHWS.
Designated Area (km ²)	27.41
Year of Designation	1998
Sampling Points	Loch Etive at Achnacloch Mussel Site - NM 96100 34000 Loch Etive at Ardchattan Mussel Site - NM 97200 34800 Loch Etive at Taynuilt Pier Mussel Site - NN 01043 32679
Commencement of Monitoring	1999

12.1 Commercial Shellfish Interests

Loch Etive is classified as a Shellfish Harvesting Area by the Food Standards Agency (FSA) for the production of Common mussels (*Mytilus edulis*) in two areas.

Loch Etive East is classified at six sites (Cadderlie, Craig, Craig Point, Glen Noe, Port Mor, Sgeir Lag Choan)

Loch Etive East: All sites (Common mussels)
2011 = A - April to June
 B - July to December
2012 = A - January to March

Loch Etive West is classified at three sites (Airds Point, Loch Etive – Spiers, Loch Etive – Lower).

Loch Etive West: All sites (Common Mussels)
2011 = A - April & December
 B - May to November
2012 = A - January to March

Category A sites are of the highest standard and means that shellfish can go directly for human consumption however category B requires that shellfish must be depurated, heat-treated or re-laid prior to human consumption.

FSA have not carried out a sanitary survey for Loch Etive

For more information on Food Standards Agency Classification please visit:
<http://www.food.gov.uk/scotland/safetyhygienescot/shellmonitorscot/shellclassesscot/>

12.2 Bathymetric Information

Loch Etive has a total length of 29.5 km and a catchment area of 1350 km². Six sills divide the loch into six water areas or basins. The lower part of the loch has five small basins and the upper section of loch has one large basin. The large basin is located between Taynuilt to the head of the loch. Maximum water depths are from 22-68 m for the smaller basins and the larger basin has a maximum depth of 139 m.

As a whole, the loch takes 14 days to flush but each basin has its own local flushing characteristics, with some deep waters exchanging significantly more slowly than this. The fresh/tidal flow ratio, which reflects the degree of possible influence of fresh water on the overall salinity, is high (4.1) due to the size and volume of the loch.

There are no morphological pressures in the waters.

12.3 Conservation Designations

North of Loch Etive is Loch Creran, Argyll designated Shellfish Water ([UKS7992332](#)), which contains three areas designated by the FSA as Shellfish Harvesting Areas. To the northwest is Lyn of Lorn Shellfish Water ([UKS7992391](#)), of which a small section is designated as a Shellfish Harvesting Area by the FSA.

To the South West lies Sound of Kerrera ([UKS7992396](#)) and Kerrera ([UKS7992355](#)) designated Shellfish Waters, both of which share areas designated by the FSA as Shellfish Harvesting Areas.

Special protected Area (SPA) – [Glen Etive and Glen Fyne](#)

Designated 28/10/2010 for aggregations of breeding birds (Golden eagle (*Aquila chrysaetos*))

Special Area of Conservation (SAC) – [Loch Etive Woods](#)

Designated 17/03/2005 for internationally important species (Otter (*Lutra lutra*)) and habitats (Alder woodland on floodplains, Mixed woodland on base-rich soils associated with rocky slopes, Western acidic oak woodland)

This is also designated as a **Water Dependent SAC** and a **Groundwater SAC**.

Site of Special Scientific Interest (SSSI) – [Barran Dubh](#)

Designated 21/03/2003 for Bryophyte assemblage and Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Bonawe to Cadderlie](#)

Designated 28/02/1990 for Igneous petrology (Caledonian Igneous) and Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Kennacraig and Esragan Burn](#)

Designated 31/03/1987 for Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Ard Trilleachan](#)

Designated 31/01/1986 for Bryophyte assemblage and Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Clais Dhearg](#)

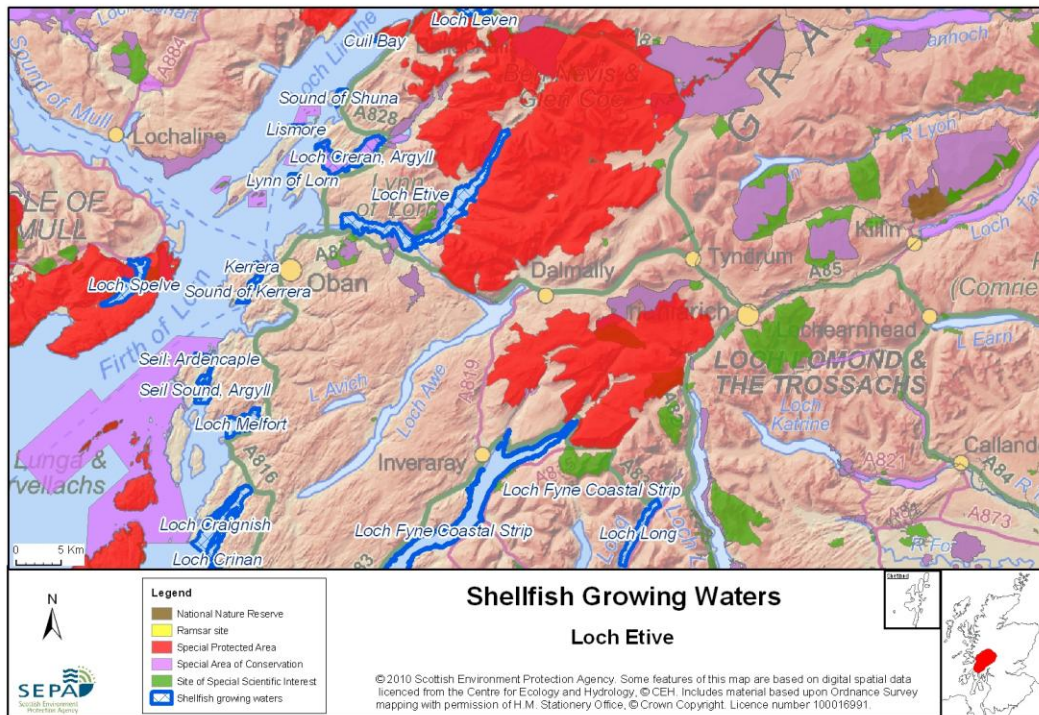
Designated 28/06/1985 for Dragonfly assemblage, butterflies (Marsh fritillary (*Euphydryas aurinia*)), Oligotrophic loch, Open water transition fen, Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Airds Park and Coille Nathais](#)

Designated 10/02/1997 for butterflies (Marsh fritillary (*Euphydryas aurinia*)), Upland oak woodland

Site of Special Scientific Interest (SSSI) – [Glen Nant](#)

Designated for 06/05/2003 for Bryophyte assemblage, Crane fly (*Tipula luridorostris*), Lichen assemblage, Upland oak woodland



12.4 Topography and Land Use – Potential Diffuse Pollution Sources

Loch Etive is 30 km long with an approximate coastline of 65 km, 25 km of which is accessible by road. The land that drains into Loch Etive is primarily used for agriculture (including forestry). The upper reaches of the loch drain approximately 350 km² of steep rocky mountains rising to over 900 m. This area is of little agricultural use other than for extensive hill sheep production and deer stalking. The lower reaches drain approximately 100 km² of less severe terrain where the agriculture is extensive systems of beef and sheep production. The biological impact on Loch Etive of run-off from land grazed by livestock is unknown. Less than 10% of the area is in managed forestry.

The main freshwater input to the designated water is from the Rivers Etive, Kinglass, Noe, Liver and Nant. The Rive Awe, which receives water from Loch Awe and the catchments of Glen Strae Glen Orchy and Glen Lochy, also drains to Loch Etive through the barrage at the Bridge of Awe. All rivers in this area are classed as of at least good quality.

The coastal communities of Taynuilt, Black Crofts and Bonawe are within the catchment of the designated water and Connel and North Connel coastal communities within 2 km of the designated water.

12.5 Point Source Discharge

Type	Name	Treatment	Consent No.	NGR	PE	Additional Information
Scottish Water Asset	Taynuilt	Secondary, via river	CP 5821	-	700	Nominated for upgrade under Q&SIII
	Bonawe	-	CD 12209	-	166	
	Black Crofts ST	-	-	-	100	To be upgraded (North Connel Scheme) by 2005/06 as part of Q&SII
Industrial	Bonawe Quarry	-	-	-	-	No discharge
Category	Name	Consent No.	NGR	Biomass (t)	Additional Information	
Fish Farm	Ardchattan Bay	CAR/L/1003325-VN1	NM97303470	350	-	
	Aird Point - Etive 4	CAR/L/1018068	NM99103400	966.7	-	
	Inverawe	CAR/L/1022266	NN02343305	250	-	
	Port na Mine	CAR/L/1010366-VN2	NN03103300	455	-	

* There is no CAR authorisation for this site at present.

12.6 Compliance Monitoring Regime

The following monitoring regime for the designated shellfish waters was implemented in the second half of 2005

Year	Monitoring Regime
2005 -	<ul style="list-style-type: none"> • Quarterly for Sal, DO, pH, temperature, visible oil • Annually for metals and organohalogenes in mussels • Twice yearly for metals in water • Quarterly for faecal coliforms in mussels

12.7 Compliance History

UKS7992312 - Loch Etive				
	Compliance history for Waters and Biota, excluding faecal coliforms data			Compliance history for faecal coliforms
Year	Overall Result	Imperative	Guideline	Guideline
1999	Fail	Pass	Fail ¹	Fail
2000	Fail	Fail ^{2,3}	Fail ^{4,5,6}	Pass
2001	Fail	Fail ^{7,8}	Fail ⁹	Fail
2002	Pass	Pass	Fail ¹⁰	Fail
2003	Fail	Fail ¹¹	Fail ¹²	Fail
2004	Fail	Fail ¹³	Fail ¹⁴	Fail
2005	Pass	Pass	Fail ¹⁵	Fail
2006	Fail	Fail ¹⁶	Fail ¹⁷	Fail (Ardchatten and Taynuilt Pier)
				Pass (Achnacloich Pier)
2007	Pass	Pass	Pass	Fail
2008	Pass	Pass	Pass	Fail
2009	Pass	Pass	Pass	Fail
2010	Pass	Pass	Pass	Pass

^{1,5,9,10,12,14,15} Guideline failures relate to low results for salinity in water taken at all three sampling sites at Loch Etive in years 1999 to 2005 which fail the standard of 12-38 ‰. There were several failures in all years at all sites ranging from 0.3 to 11.9 ‰. These failures are entirely natural, and were due to large fresh water inputs to the loch at the time.

² Failure applies to a single result of 5.25 µg/l Cu in water taken at Achnacloich in 2000 which fails the Imperative standard of 5 µg/l. This result was from one of two replicates sampled in June 2000. The other replicate and the other two samples collected in November 2000 passed for both Guideline and Imperative standards for Cu in water.

⁴ Failure applies to a result of 25 mg/kg dry wt Cu in mussels taken at Achnacloich Pier in 2000 which fails the Guideline standard of 15 mg/kg dry wt .

³ Failure applies to a single result of 12.3 µg/l Cr in water taken at Taynuilt Pier in 2001 which fails the Imperative standard of 10 µg/l.

⁶ Failure applies to a result of 105 ng/g Total DDT in mussels taken at Achnacloich Pier in 2000, which slightly exceeds the Guideline standard of 100 ng/g wet wt. The site passed for all Imperative standards. This result was from only one of two

batches of mussels sampled in 2000. The other sample passed for both Guideline and Imperative standards for Total DDT in mussels.

^{7,8} Failures apply to results of 14.2 µg/l Zn and 12.7 µg/l Zn taken in water at Achnacloch and Taynuilt Pier respectively in 2001. These fail the Imperative standard of 10 µg/l. These results were from one of two batches of water sampled in 2001. The other sampling passed for both Guideline and Imperative standards for Zn in water. 13 Failure applies to result of 10.9 µg/l Zn at Ardchatton Jetty in 2004 which fails the Imperative standard of 10 µg/l.

¹¹ Failure applies to two pH results of 6.51 and 6.67 in 2003 at Taynuilt. These fail the Imperative standard of 7-9.

¹⁶ Failure relates to the Shellfish Water's imperative results of 15.5 for zinc taken in water at Loch Etive at Achnacloch Pier in March 2006.

¹⁷ Failure relates to the Shellfish Water's guideline results of 5.87 for chromium taken in biota at Loch Etive at Ardchatten in March 2006. The breach of this mandatory standard has resulted in an overall fail at this site in 2006.

12.8 Future Monitoring

Biannual sampling is continuing for metals and organochlorines in waters along with annual sampling of mussels for organohalogenes and metals. This loch will also be monitored at all three sites and monthly for T, Sal, DO and pH in water. Quarterly monitoring for faecal coliforms in mussels will also continue.

In the event of any sample failing to comply with any chemical parameter EQS, the site will be revisited and re-sampled for the failed parameter. Samplers are asked to identify any evidence of visible harm to the shellfish population at the site.

12.9 Improvement Actions

The septic tank at Black Crofts was upgraded by pumping to the North Connel scheme under Q&SII.

Taynuilt septic tank is to get disinfection under Scottish Water's Quality and Standards IIIa programme.

Bonawe septic tank is due to be upgraded including disinfection in March/April 2008 under late delivery Q&SII.

WFD Objectives

Under the Water Framework Directive, the target objectives expect this shellfish water to Pass by 2015 (first River Basin Management Plan Cycle) for Imperative Shellfish Growing Water Standards, with high confidence. The Guideline Shellfish Growing Water Standards are not predicted to pass until the second River Basin Management Plan Cycle in 2021, with low confidence.

Objective	First Cycle 2015	Confidence	Second Cycle 2021	Confidence	Third Cycle 2027	Confidence
Imperative Shellfish Growing Waters Standard	Pass by 2015	High	Pass by 2021	High	Pass by 2027	High
Guideline Shellfish Growing Waters Standard	Fail by 2015	Low	Pass by 2021	Low	Pass by 2027	Low

12.10 Summary of Actions

Action	Deadline
Taynuilt septic tank for disinfection under Q&SIIIa	Not specified
Bonawe septic tank for upgrade and disinfection under late delivery Q&SII.	2008