River South Esk Catchment Summary

Introduction

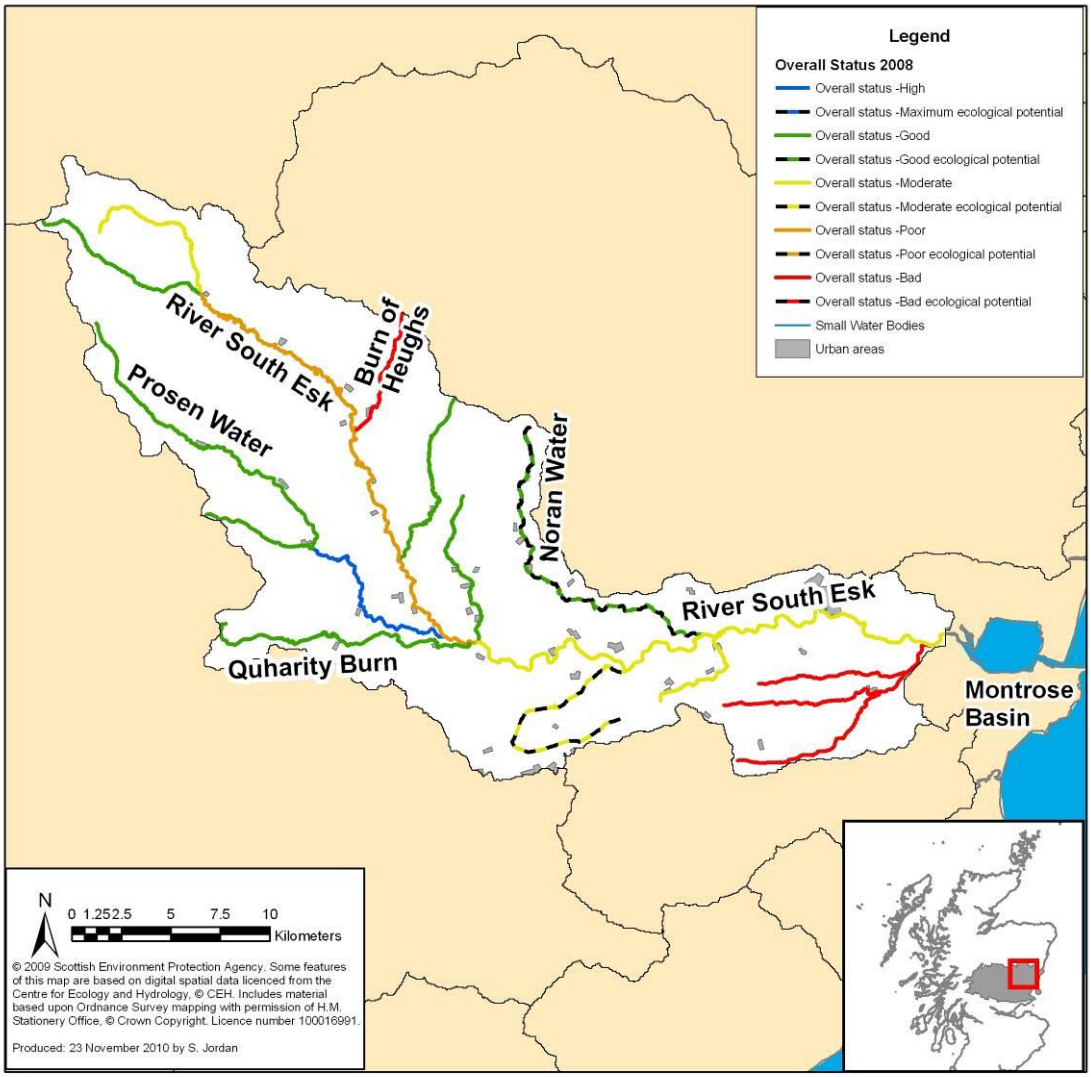

Figure 1: South Esk Catchment

From its source high in the eastern Cairngorms, the South Esk flows across the productive, agricultural land of Strathmore before entering the Montrose basin and finally the North Sea, draining an area of approximately 564km^2. The catchment contains 14 baseline[1] surface water bodies, 7 of which are currently not achieving good status. There are also 6 groundwater bodies associated with the catchment, of which only 1 is achieving good overall status.

Agriculture is a particularly important land use within the catchment and as a result, diffuse pollution is a significant problem. There are a number of statutory designations across the South Esk. Since 2004, the South Esk river system has been designated a Special Area of Conservation (SAC) for Atlantic salmon and freshwater pearl mussels. It is also a Salmonid River, designated under the Freshwater Fisheries Directive.

Located at the head of the catchment lies Caenlochan, an upland area designated as an SAC, SPA and SSSI. Caenlochan supports an extensive range of upland habitats and vegetation, rare plant species, as well as breeding Dotterel and Golden Eagle populations. Within Caenlochan also sits the Corrie Fee National Nature Reserve

and it should be noted that the upper reaches of Glen Clova and Glen Prosen fall within the boundary of the Cairngorms National Park.

Montrose Basin, an enclosed estuary at the foot of the South Esk catchment has been designated as a Special Protection Area (SPA) and a Site of Special Scientific Interest (SSSI). The Basin also qualifies as a Wetland of International Importance (Ramsar) supporting a diverse range of wintering wildfowl and waders. Beyond Montrose Basin, the South Esk discharges to the North Sea, south of the designated Bathing Water of Montrose.

The lower reaches of the South Esk catchment, namely from Finavon down, has been designated as a Nitrate Vulnerable Zone (Strathmore and Fife NVZ) and the Noran Water is a Drinking Water Protected Area, based on potential drinking water abstractions from Glenogil Reservoir.

Further information on the South Esk Catchment can be found on the RBPM interactive map.

The Tay area management plan and information about the Tay area advisory group can be found on SEPA's website.

Priority Catchment Status

The River Tay catchment is a diffuse pollution priority catchment for work in the first river basin planning cycle (2009 – 2015). Priority catchments contain some of Scotland's most important waters for drinking, bathing, conservation and fishing and have been selected using a risk based approach for action. Whilst focusing on these catchments to address diffuse pollution pressures, the mitigation of other impacts on the water environment will also be considered. This may include morphological alterations, the reduction of abstraction pressures, flood management and the control of invasive non native species. Improvement measures will be coordinated with the work of the Tay area advisory group.

SEPA has appointed dedicated priority catchment coordinators to investigate the issues within each catchment and liaise with land managers and stakeholders. More information is available on SEPA's website.

As part of the priority catchment approach, targeted measures will be implemented for specific water bodies within this catchment.

Classification and pressures summary

The status and pressures relating to all of the water bodies in the South Esk Catchment are detailed in the following tables.

Table 1: Classification status, pressures and objectives for the 14 baseline surface water bodies within the South Esk catchment in 2009

Surface Water Body	Water Body ID	2009 Classification	Pressures	Good by
Prosen Water (Burn of Lednathie to S Esk Confluence	5809	High ecological Status	-	-
River South Esk (Source to White Water Confluence)	5801	Good ecological status	Alien species- N American Signal Crayfish	-
White Burn	5807	Good ecological Status	-	-
Quharity Burn	5808	Good ecological Status	-	-
West Burn of Glemoye	5811	Good ecological Status	-	-
White Water	5813	Good ecological Status	-	-
Noran Water	5805	Good ecological Potential	-	-
River South Esk (White Burn Confluence to Estuary)	5799	Moderate ecological status	Alien species- N American Signal Crayfish Abstraction- arable farming Point source pollution- sewage dispoal	2013
Prosen Water (Source(s) to Burn of Lednathie Confluence	5810	Moderate ecological status	Morphology- barriers to fish passage	?
River South Esk (White Water to White Burn Confluences)	5800	Poor ecological status	Abstraction- arable farming Alien species- N American Signal Crayfish	Moderate by 2027
Pow Burn	5802	Bad ecological status	Diffuse source pollution- arable farming, forestry Morphology- multiple pressures, forestry Abstraction- arable farming	2024
Melgund Burn	5804	Bad ecological	Morphology-	2014

		status	multiple pressures, arable farming Diffuse source pollution- arable farming	
Lemno Burn	5806	Bad ecological potential	Morphology Diffuse source pollution- arable farming, sewage disposal Abstraction- arable farming,	2026
Burn of Heughs	5812	Bad ecological status	Abstraction- renewable electricity	2024

NB: Pressures that have already been addressed and pressures that have been assessed as having achieved good ecological potential (GEP) are not included within this table.

Small water bodies

There are also small (non-baseline) surface water bodies associated with the catchment. If there are any issues associated with these small water bodies which significantly impact a downstream baseline water body, then a pressure will be regarded against the baseline water body so that it will be addressed. It should be noted however that as the Water Framework Directive applies to the whole water environment we should be harnessing opportunities to improve the condition of any small water body where possible.

Table 2: Classification status, pressures and objectives for the groundwater bodies associated with the South Esk Catchment in 2009

Groundwater	Water Body ID	2009 Classification	Pressures	Good by
Glen Esk bedrock and localised sand and gravel aquifers	150387	Good overall status	-	-
Brechin bedrock and localised sand and gravel aquifers	150270	Poor overall status	Diffuse source pollution- arable farming Abstraction- arable farming	Natural recovery
Lunan/Pow bedrock and localised sand and gravel aquifers	150266	Poor overall status	Diffuse source pollution- arable farming Abstraction- arable farming	Natural recovery
Laurencekirk bedrock and	150269	Poor overall status	Diffuse source pollution- arable	2015

localised sand and gravel aquifers			farming Abstraction- whisky production	
Montrose bedrock and localised sand and gravel aquifers groundwater	150267	Poor overall status	Diffuse source pollution- arable farming	2021
South Esk Valley sand and gravel aquifers	150273	Poor overall status	Diffuse source pollution- arable farming	2015

Protected areas
For protected areas the required objective is no deterioration by 2015.

Table 3: Status of protected areas

Protected area (PA) designation	No. WBs	Condition/ Classification	PA ID	Name
Freshwater Fish (Existing)	1	Mandatory = Pass Guideline = Fail	UKS7865992	River South Esk
Drinking Water Protection Zone	5	Pass	100218	Backwater Reservoir
		Pass	150262	Alyth bedrock and localised sand and gravel aquifers
		Pass	150270	Brechin bedrock and localised sand and gravel aquifers
		Pass	150273	South Esk Valley Sand and Gravel
		Pass	150387	Glen Esk bedrock and localised sand and gravel aquifers
UWWTD Sensitive Area (Existing)	2	-	UKS9127134	East Pow Burn
		-	UKS9127172	River South Esk
Special Area of Conservation	1	Unfavourable	UK0030262	River South Esk

Pressures, measures and objectives summary

No deterioration objectives
Only one of the water bodies currently at good ecological status is impacted by any pressures (WB 5810). Under the Water Framework Directive we have a requirement to ensure that there is no deterioration in the status of these water bodies.

For those water bodies currently at less than good ecological status the objective is to ensure that no further deterioration occurs, in addition to any improvement objectives.

In the case of the heavily modifies water bodies which are at good ecological potential (GEP), there is a need for SEPA to verify the assessment that the pressures associated with the reason for the heavily modified designation are at GEP. The objective for these is to ensure that there is no deterioration.

Water Resources

Abstraction which alters the natural flow of water conditions is a key pressure on several of the South Esk sub-catchments, namely the Pow Burn, Lemno Burn, Burn of Heughs and the South Esk between the confluence with the White Water and the Montrose Basin. Water is abstracted for irrigating arable land, feeding a small-scale hydro-electric scheme, a distillery and fish farming. Reduction in flows through over abstraction can stress the ecosystem and impair the ability of a watercourse to dilute polluting inputs from both point and diffuse sources. The licence reviews under the Controlled Activities Regulations should bring about improvements over the three river basin management planning cycles.

Point Source Pollution

Only the water body of the River South Esk (White Burn Confluence to Estuary) (5799) is noted as being affected by a point source, and is associated with sewerage disposal. This is expected to be remediated by 2013 by increasing treatment during Scottish Water's current quality and standards investment cycle, allowing for a good status to be achieved within the first RBMP cycle. Private sewage systems also make a small but significant contribution to the nutrient loading in the catchment.

New regulations that come into effect in January 2015 will reduce the phosphorous content permitted in domestic laundry detergents. Laundry detergents are currently estimated to account for 7.5% of the total phosphorous in sewage, so the regulations should reduce the amount of phosphorous being lost to rivers in sewage effluent.

Diffuse Pollution

Five diffuse pollution pressures exist within the catchment, three of which result from arable farming activities within the Pow Burn (5802), Melgund Burn (5804) and Lemno Burn (5806), which are expected to be remediated by 2014. The other two pressures are a result of forestry and sewage disposal activities on the Pow and Lemno Burns, but are not planned to be remediated until 2024 onwards.

<u>Sediment</u>
The Melgund, Lemno and Den Burn have recorded the highest suspended solids concentrations, with values noticeably higher than in the main stem of the river.
Fifty percent of the world's freshwater pearl mussel population reside in Scottish rivers. Studies in the River South Esk in 2003 and 2009 found its freshwater pearl mussel population to be in ''unfavourable condition''. They are particularly sensitive to elevated nutrient concentrations, sediment inputs and alterations to the physical structure of rivers. Sedimentation is known to place particular pressure on the filter feeding pearl mussels, especially the ability of juveniles to establish and grow in the riverbed.

<u>Catchment Walk Survey</u>
In order to assess the nature and extent of issues affecting the status of the catchment, SEPA staff walked approximately 400km of the river and its tributaries during April and May 2010. The focus of this work was to collect information on

diffuse pollution sources, notably, breaches of the Diffuse Pollution General Binding Rules (DP GBR's). In total, 504 breaches of the DP GBR's were found, as well as 95 cases of good practice such as the presence of buffer strips and water troughs. The vast majority of breaches were regarding GBR's 19 and 20. 260 breaches were noted relating to livestock, including significant poaching or erosion of land within five metres of surface water and livestock feeders being positioned within 10 metres of surface water or wetlands (DP GBR 19). 234 breaches were noted due to land being cultivated within two metres of a surface water or wetland (DP GBR 20)

Morphology

Alterations to the channel and bank have resulted in four pressures within the catchment concerning the Pow (5802), Melgund (5804) and Lemno Burns (5806), of which two are caused by forestry and arable farming practices. Remediation is expected in the first cycle, for all except the Lemno burn (HMWB) and the Pow burn's forestry pressure. These will be addressed in the third and second cycles respectively. Other morphological pressures are as follows:

Table 4: Details of morphological Pressures

Location	Morphological Issue	Remedial action
Moulzie	Restricted channel in 8 locations due to boulder bank protection	Planned in FWPM LIFE BID 2012-2016
Acharn	Restricted channel in 4 locations due to boulder bank protection	Planned in FWPM LIFE BID 2012-2016
Braedownie	Restricted channel due to boulder bank protection	Planned in FWPM LIFE BID 2012-2016
Rottal Burn	Lowest 1km Canalised	ERFT 2011-2012
Pow Burn	Whanlan Fish pass disintegrated	ERFT 2010 (Completed)

In 2008 fencing work to control erosion in Glen Clova was completed as part of the Conservation of Atlantic Salmon in Scotland (CASS) project. The fencing covers both banks of the river from Gella Bridge to 4km beyond the Clova Bridge. Despite these improvements, the results of the 2010 Catchment Walks have highlighted the need for further restoration.

Also under the CASS project, in 2008 research was undertaken on the Rottal Burn by the Centre for River Restoration Science (CRRESS), which advised that the proposal to undertake habitat restoration work would not be feasible

Morphological priority catchment work will also be undertaken on the Pow Burn and Melgund Burn, and within the River South Esk Special Area of Conservation (SAC); with the latter work regarding habitat restoration for freshwater pearl mussels. This work will be undertaken by the Tay District Salmon Fisheries Board within the first RBMP cycle. The Forestry Commission will also be addressing riparian issues on the Pow Burn, with the work being completed in the second cycle as part of the priority work. Furthermore, plans are being developed in 2011 to improve the riparian zone in Glen Clova with a view to implementation in 2012-2016. Finally, SEPA is funding a scoping study through the Water Environment Restoration Fund in which SNIFFER are investigating morphological restoration options.

Barriers to fish passage

Two significant barriers to fish passage have been identified in the South Esk Catchment. On the Pow Burn there is an old fish pass that is no longer operational and requires renovation. Envirocentre are in the process of developing proposals for the fish pass on behalf of The Esk Rivers Fisheries Trust (ERFT). The renovation will also take the migration of eels into consideration.

A study carried out by SEPA on behalf of ERFT found significant evidence to suggest that Boysack Weir, on the Lunan Water, is also acting as a fish barrier. Funding has been secured for the construction of a new fish pass through the SEPA restoration fund. Details of the study can be found on the ERFT website.

Invasive non-native species

A Biosecurity Plan of the Esk District was published in 2009 by the ERFT. The pressure of invasive non-native species is present throughout the South Esk (White Burn Confluence to Estuary - 5799, White Water to White Burn Confluences - 5800, and Source to White Water Confluence 5801). The catchment was surveyed in 2009 for Giant Hogweed, Japanese Knotweed and Himalayan Balsam. A 5-year eradication programme began in 2010 in respect to the former two species. A recent progress report for the this project can be viewed ERFT website

The implementation of the Scottish Mink Initiative, which aims to remove breeding American mink from the north of Scotland, also began in the South Esk in 2011. Details can be found on the South Esk Catchment Partnership website.

Heavily Modified and Artificial Water Bodies

The Noran Water (5805) and Lemno Burn (5806) water bodies within the catchment are both heavily modified, with the former affected by a water collection, purification and distribution pressure and the latter by various abstraction and morphological pressures.

The Noran burn is expected to be remediated within the first planning cycle, which should allow it to go from achieving good ecological potential to achieving good status through the removal of the pressure; and the Lemno Burn is expected to improve through the first planning cycle and remediated by the third cycle. This is occurring over a longer period due to the more complex nature of the morphological pressure.

Groundwater

Six groundwater bodies are associated with the catchment, with their current respective quality status being shown in Table.2. Those classified as poor are affected by abstraction and diffuse source pollution pressures, with all but one (whisky production) resulting from the arable farming industry.

Various time periods for achieving good chemical status have being projected for those groundwater bodies currently at poor status, with the Laurencekirk and South Esk valley groundwaters expected in the first planning cycle, and the Montrose basin in 2021 (second cycle). The Brechin and Lunan/Pow groundwaters are projected to recover naturally, over a time period longer than the three initial cycles.

The Glen Esk bedrock and localised sand and gravel aquifer (150387) is projected to remain at good status throughout the current and future cycles.

Areas of Action

The following areas of action, to address the various pressures within the South Esk Catchment, are ongoing or planned:

Table 5: Areas of action

Action	Suggested owner	Date
Ensure Scottish Water measures, including sewage disposal on River South Esk (White Burn Confluence to Estuary), are on track to deliver	SEPA quality and standards team	Ongoing - 2121
CAR irrigation licence review to address abstraction pressures	SEPA/ Tay AAG	2027
Work with landowners and link with restoration strategy to address morphological pressures	SEPA/ Tay AAG	Ongoing - 2021
Ensure links between RBMP and FCS in relation to forestry related morphological issues on the Pow Burn	SEPA/ Forestry Commission Scotland	2027
Ensure links between RBMP and FCS in relation to forestry related diffuse pollution issues	SEPA/ Forestry Commission Scotland	2024
Determine measures to alleviate diffuse source pollution pressures. Use the results of the catchment walk survey to target problem areas	SEPA/ Tay AAG	Ongoing - 2015
Raise awareness of rural diffuse pollution and Diffuse Pollution General Binding Rules to prepare for priority catchment work	RBMP coordinator/ Tay AAG	Ongoing
Continue to monitor and control Non Native Invasive Species. The implementation of The Esk Biosecurity Plan is ongoing, as is the Scottish Mink Initiative	ERFT/ RBMP coordinator/ Tay AAG	Ongoing - 2027
Renovation of Pow Burn fish pass was recently completed. Funding for the construction of a new fish pass at Boysack Weir has been secured	ERFT/ SEPA	Ongoing/ completed
Investigate alternative measures to improve Rottal Burn	ERFT	Ongoing
Morphological priority catchment work on Pow & Melburn Burns, and within SAC	Tay District Salmon Fisheries Board	Ongoing First cycle
Address riparian issues along the Pow Burn	Forestry Commission Scotland	Second cycle
Morphological restoration scoping study	SNIFFER, SEPA	Ongoing First cycle