



NRA-wates 56

Tawe and South  
Gower Catchment  
Management Plan  
Consultation  
Report Summary



**NRA**

*National Rivers Authority  
Welsh Region*

**Guardians of  
the Water Environment**

March 1994





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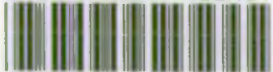
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## NOTES

## INTRODUCTION

The rivers, lakes, estuaries and coastal waters of Wales are subject to large and rapidly increasing demands from the users of water. Many different uses interact, or compete for water or water space, and will inevitably come into conflict with one another. The National Rivers Authority (NRA) was created in 1989 as an independent environmental watchdog. Its prime purpose is to maintain and improve the water environment and regulate the use of water by industry, agriculture and the private water and sewerage companies. The NRA's general duties include:

- Maintenance and improvement of water quality by control of pollution in surface and groundwater.
- Flood defence for people and property.
- Flood warning.
- Management of water resources.
- Maintenance and improvement of fisheries.
- Conservation of the natural water environment.
- Promotion of water based recreation.
- Navigation (in some rivers).

In addition, the NRA has a responsibility to reconcile conflicts between water users and plays a key role in the strategic management of the interaction between users of the water and land environments. We believe it is important that the interests of all water users are considered in the development and protection of the water environment and have consequently chosen to promote our vision and management proposals via published Catchment Management Plans (CMPs).



## YOUR VIEWS

The Tawe and South Gower CMP Consultation Report is our assessment of the catchment and identifies the key issues which need to be resolved. These are outlined in the tables at the end of this summary report.

We need your views:

- What do you think about the Plan in general?
- Have we identified all the uses?
- Have we identified all the issues?
- What do you think about the options we propose?

If you would like to comment on this document, or receive a copy of the full Consultation Report, please write to:

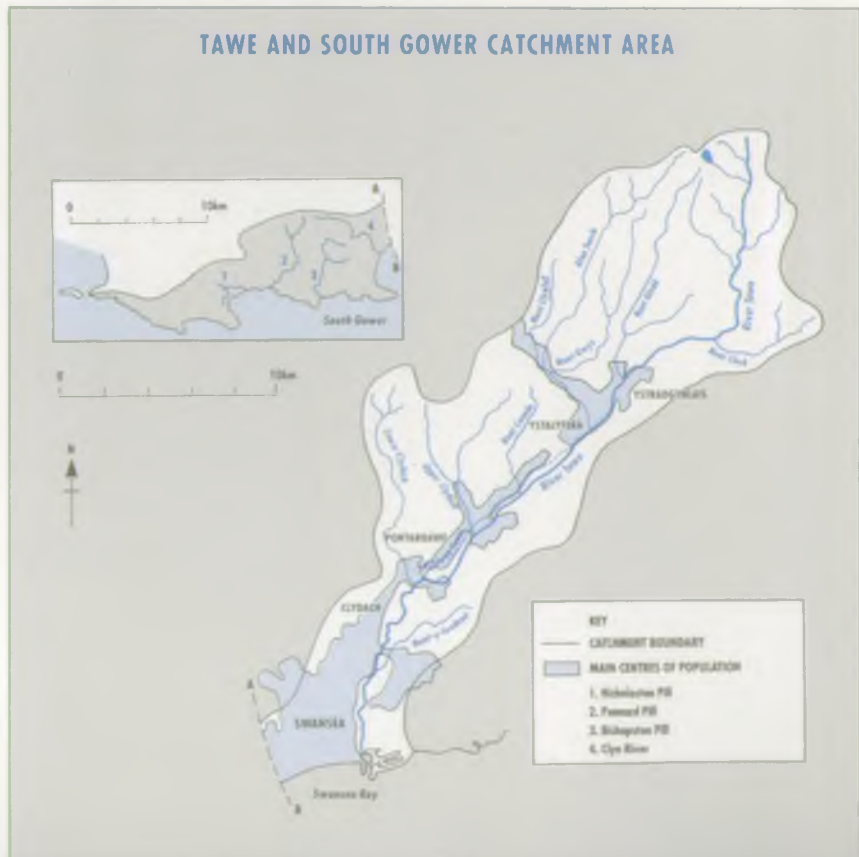
**THE AREA CATCHMENT PLANNER**

**NATIONAL RIVERS AUTHORITY**

**LLYS AFON, HAWTHORN RISE**

**HAVERFORDWEST, DYFED SA61 2BQ**

**TEL. HAVERFORDWEST (0437) 760081**



OPTIONS	Responsibility	Advantages	Disadvantages
Encourage angling clubs/ riparian owners to allow canoeing on a limited scale and with special conditions	NRA/Angling Clubs/Canoeing Associations/ Riparian Owners	Enhance recreational potential  Possible income for angling clubs	Possible disturbance to fisheries, conservation and angling interests



## ISSUE No: 45

## Tawe barrage may impede salmonid migration despite presence of fish pass

Options	Responsibility	Advantages	Disadvantages
Monitor adult salmonid migration through the barrage by electronic tracking to assess effectiveness of the fish pass	NRA/Swansea City Council	Improved understanding of fish pass effectiveness  Identification of remedial requirements	Cost: unknown  Resource implication
Monitor smolt migration through the barrage to determine any effects on their behaviour	NRA/MAFF/Swansea City Council	Assurance that the barrage does not pose an obstruction to smolts  Identification of remedial opportunities	Resource implication  Cost: unknown
Monitor trap catches at Panteg Weir.	NRA/Swansea City Council	Indicative of changes in adult status	Resource implication
Monitor anglers catches by Log Book Scheme.	NRA/Angling Clubs/Swansea City Council	Indicative of adult salmonid catchability	Resource implication

## ISSUE No: 46

## Development of recreational facilities at Fendrad Lake in Swansea

OPTIONS	Responsibility	Advantages	Disadvantage
Develop a management plan for the lake, balancing the safety issues and the potential conflict between coarse anglers and jet-skiers	Swansea City Council	Optimise use of resource and minimise conflict	Cost: unknown  Safety implications

## CATCHMENT STATISTICS

### GENERAL

Area	272 km <sup>2</sup>
Population (1991 Census)	232,100
Population Density	853/km <sup>2</sup>

### TOPOGRAPHY

Ground Levels	Max height	802m AOD
Sea Levels (Swansea)	Mean High Water Springs	4.5m AOD
	Mean Low Water Springs	-3.9m AOD

### WATER QUALITY

#### Length of River in 1990 River Quality Survey

Very Good	16.8km
Good	48.2km
Fair	none
Poor	7.9km
Bad	none

#### Tawe Estuary

Good	6.2km
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### WATER RESOURCES

Annual Average Rainfall	1980mm
Primary Gauging Station	Tawe at Ynystanglws

### FLOOD PROTECTION

Length of Designated Main River	100.73km
Length of River on which Flood Alleviation Schemes implemented of which	12.59km
Hard Defences	0.81km
Soft Defences	11.78km
Length of River covered by a Flood Warning Scheme	34km

### FISHERIES

Average Annual Declared Rod Catch (1982-1991)	538 sea trout
	57 salmon

## THE NRA'S VISION FOR THE TAFE AND SOUTH GOWER CATCHMENT

The Tawe and South Gower catchment provides local residents and visitors with a wealth of spectacular scenery and wildlife around the City of Swansea and valley conurbations. In the north, the catchment is almost completely unspoilt, the wild uplands being protected by the umbrella of the Brecon Beacons National Park. The physical nature of the middle and lower reaches of the river has been managed over the years, and regular maintenance to protect people and property from flooding takes place. The historical heavy industrial use of the lower Swansea valley is reflected in the large dock complex, part of which has now been converted into a marina. The river discharges into the dramatic seascape of Swansea Bay, which sweeps around on the western side towards the beautiful Gower peninsula, whose sandy beaches attract thousands of visitors each year.

Swansea's industrial past, and particularly its pre-eminence for metal refining, left a legacy of heavy metal contamination over hundreds of hectares of land, and within the river and Swansea Bay. The reclamation and rehabilitation of these contaminated areas within the lower Swansea valley must be regarded as one of the success stories in the South Wales valleys and, with assistance from the NRA and its predecessors, a significant migratory fishery has become re-established within the last 15 years.

It is perhaps ironic that the latest, and most ambitious, project - the construction of the first tidal barrage in England and Wales, completed in 1992 - is threatening to cause new water quality problems and may be obstructing salmon and sea trout as they return to spawn. The potential problems that this structure presents must now be considered the most demanding of the challenges to be addressed within the life of this Plan.

The impact of sewage effluent on water quality in river and sea remains a significant issue. During the life of the Plan, major improvement schemes for Swansea Bay should be completed. Outstanding problems downstream of Trebanos sewage treatment works, together with the more extensive problems caused by unsatisfactory combined sewer overflows (CSOs) throughout the catchment, must be addressed.

The success of Dwr Cymru's second Asset Management Programme (AMP2) in delivering improvements to the most environmentally significant CSO problems, will have a major influence on the NRA's aspirations for the catchment.

Further improvement in the migratory fishery will be dependent upon the NRA being able to secure safe passage past the barrage, control poaching, improve access for migratory fish to obstructed tributaries, and stabilise gravels for spawning.

ISSUE No: 43			
The presence of coarse fish in the middle and lower reaches of the Towe			
Options	Responsibility	Advantages	Disadvantages
Monitor the distribution/ species composition of coarse fish	NRA	Better stock management  Identification of control measures	Cost: unknown
Give dispensation to coarse anglers with special conditions: e.g. restricted season, catch returns, hook sizes	NRA/Coarse Anglers	Increased utilisation of resource	Conflict with some game anglers  Possible inadvertent exploitation of smolts and/or adult salmonids

ISSUE No: 44			
Illegal fishing reduces the stock of migratory fish for bona fide angling and spawning			
Options	Responsibility	Advantages	Disadvantages
Continue enforcement of legislation in conjunction with other enforcement bodies	NRA/Other enforcement bodies	Protects stocks for legitimate harvesting and spawning	Cost of enforcement activity
Review effectiveness of SWSFC and other byelaws and introduce new proposals where necessary	NRA/SWSFC	Protect stocks for legitimate harvesting and spawning	Monitoring cost  Effectiveness uncertain

## ISSUE No: 41

## Development on flood plains and their conflict with flood defence requirements

Options	Responsibility	Advantages	Disadvantages
Close liaison between NRA & Local Authorities to ensure protection standards are not compromised	NRA/Local Authorities	No reduction in existing flood protection. Developer pays for any necessary mitigation works rather than the public	Cost to developer
Keep river banks free from development	NRA	Ensures that existing defences and river can be maintained at reasonable cost and new defences provided in future	Reduction in land available for development

## ISSUE No: 42

## Bankside developments have potential to reduce the conservation value of the river corridor

Options	Responsibility	Advantages	Disadvantages
Provide protection for minimum of 7m from river bank by all developments	NRA/Developers	Preservation of conservation value within river corridor	Cost to developer
Discourage bankside developments where appropriate	NRA/Local Authorities	As above, especially for otter recolonization	Cost: unknown

The realisation of the NRA's vision will be achieved through a balanced management approach to all activities so that the optimal potential of the catchment can be obtained and sustained in active collaboration with all users of the catchment.



#### GENERAL

The Tawe and South Gower Catchment Management Plan (CMP) area includes the hydrological catchment area of the River Tawe, as well as Gower streams draining in a southerly direction between Worms Head and the mouth of the Tawe (North Gower streams will be included within the Loughor CMP, scheduled for launch in 1995/6).

#### DEVELOPMENT & LAND USE

The source of the Tawe is in the Black Mountains above Llyn-y-Fan Fawr, some 590m above sea level. These upland areas provide rough pasture for sheep grazing, whilst lower lying areas are used for mixed beef, dairy and sheep farming, although the level of agricultural activity within the catchment is relatively low. Some small discrete areas of coniferous forestry are to be found in the catchment, as well as some extensive broadleaf woodlands on South Gower.

The Tawe has been, and is continuing to be, affected by development. Urbanisation is concentrated mainly in the south of the catchment at Swansea, as well as some large towns and ribbon development hugging the corridors of the main river and its principal tributaries. The City of Swansea occupies a position at the mouth of the Tawe, extending inland some 9km. The catchment has a very well developed infrastructure with good motorway and railway links.

The lower Tawe estuary has been significantly changed by the construction of a barrage which retains river water within an impoundment. This is the first such barrage to be constructed within England and Wales. Completed in 1992, the barrage consists of primary and secondary weirs with an associated navigational lock and fish pass. The scheme also includes a small reversible turbine hydrogenerator.

From the early 18th Century, the lower Swansea Valley was a centre for metal refining, principally copper smelting. This area has been redeveloped as the Swansea Enterprise Zone, resulting in stabilisation of much of the tipped material. Any future developments that involve disturbance of contaminated land present possible risks to ground and surface water quality.

Coal mining has historically been extensive in the middle section of the catchment. Although there are now no operational deep mines, there is an increasing number of small private mines and washeries. Opencast mining is also carried out at a number of locations although there are currently no British Coal sites located entirely within the catchment.

## WATER QUALITY

Water quality within the main watercourses is generally high, 87% of the classified reaches being within classes 'very good' or 'good' in the 1990 River Quality Survey.

Eleven significant sewage discharges occur within the catchment, six of which are made to coastal waters. Sewage effluent from the lower Swansea Valley and the City of Swansea is discharged following preliminary treatment



ISSUE No: 38 Potential intake of migratory fish caused by the barrage hydropower abstraction			
Options	Responsibility	Advantages	Disadvantages
Need to review adequacy of safeguards once a scheme is operational in the light of results from tracking surveys.	NRA/Swansea City Council	Reduction in potential loss of fish	Resource implications of the study.  Cost of any remedial measures.

ISSUE No: 39 There is a need to identify areas where the conservation value has been degraded			
Options	Responsibility	Advantages	Disadvantages
Undertake a River Corridor Survey (RCS) in the catchment (currently programmed for 1994)	NRA	Highlight areas requiring improvement and those requiring additional protection	Cost: £80 per km of river surveyed

ISSUE No: 40 Disturbance to spawning gravels during Flood Defence gravel removal exercise			
Options	Responsibility	Advantages	Disadvantages
Monitor levels of disturbance caused by in-river works and implement sympathetic construction of gravel catchpits at Glyntawe	NRA	Minimise need for in-river works and co-ordinate timing to cause minimal disturbance  Bed stability improved	Disturbance of river adjacent to catchpits  Inevitable loss of amenity



ISSUE No: 34 Invasive Japanese Knotweed present throughout the catchment			
Options	Responsibility	Advantages	Disadvantages
Continue to implement effective and co-ordinated control measures within the catchment. Refine methods and adopt "best practice"	NRA/CCW/Local Authorities	Improved native habitat  Improved access  Reduce cost of activity, find effective method of eradication	Cost: £30k  Resource implication  Reinvasion possible

ISSUE No: 35 Availability of holding pools, spawning gravels and nursery areas for migratory fish			
Options	Responsibility	Advantages	Disadvantages
Habitat improvement and/or re-creation e.g. gravel raking, importation, stabilisation, weir re-construction	NRA	Increased natural productivity	Cost: variable depending upon nature/extent of works  Disturbance/maintenance

ISSUE No: 36 "Standards of service" for SSSIs have not been formally agreed with CCW			
Options	Responsibility	Advantages	Disadvantages
Agree "standards of service" and implement	NRA/CCW	SSSIs safeguarded	Cost: unknown

ISSUE No: 37 Lack of suitable riverside footpaths, especially beside the main Tawe			
Options	Responsibility	Advantages	Disadvantages
Undertake a feasibility study to identify areas where access could be improved	NRA/Local Authorities/ Riparian Owners	Enhance recreational potential and access to the river corridor	Resource implications of study  Cost of construction and maintenance

(screening), via a tidally controlled short sea outfall off Mumbles Head. A major scheme, which will include provision of a long sea outfall, is currently being designed by Dŵr Cymru to provide full treatment and disinfection of this discharge during 1997.

The only significant industrial discharge to the catchment is made from the INCO Europe Ltd nickel refinery at Clydach on the Tawe.

Heavy metals (in particular zinc) continue to adversely affect water quality in the Nant-y-fendrod and the Tawe, largely due to historical uses of the catchment. Levels of metals in the river sediments are high and the Tawe Barrage may increase the availability of these within the impounded section.

## WATER RESOURCES

Annual average rainfall figures vary considerably with altitude across the catchment area, from approximately 1100mm at Mumbles Head to over 2400mm in the Black Mountains to the north. Water use is varied, the emphasis being on industrial use in the urbanised areas of the Tawe and agricultural use in the rural Gower area.

Although most of the potable water supply comes from outside of the catchment, Dŵr Cymru does abstract water from a spring at Parkmill on Gower for this purpose.

The British Waterways Board (BWB) abstract water from the Tawe to feed the Swansea Canal, from which there are a further four abstractions. Water is also abstracted by the coal industry at Abernant and Tirbach, and for water bottling on the Gower and from the Twrch and upper Tawe.

Abstraction for spray irrigation is largely confined to the Gower peninsula, although many small agricultural abstractions from groundwater are scattered throughout the catchment.

Two sites abstract water for the purposes of rearing fish.

## FLOOD DEFENCE

Flood defence interest in the catchment is centred primarily on the main urbanised areas of Ystradgynlais, Ystalyfera, Pontardawe, Ynystawe and Morriston. Flood defences have been constructed to



cope with the increased runoff experienced as a result of such high levels of development.

The Tawe characteristically carries a heavy sediment load. As a result of this, shoaling occurs extensively along the river channel and can result in increased flood risk.

South Gower watercourses generally drain more rural catchments than those of the Tawe. However, there are a number of sites where property is at risk of flooding and where flood alleviation schemes have been undertaken.

The coastal flood plain adjoining Swansea Bay is heavily developed and much of its length is protected by coastal defences. Lowering of beaches and sand loss around Swansea Bay has the potential to reduce the level of protection provided by coastal defences and will need to be monitored.

The NRA operates a flood warning system on the Tawe. This involves continuously monitoring weather and potential flooding conditions, and issuing warnings via the police as appropriate.

## FISHERIES

The fisheries of the Tawe have recovered significantly in recent years due to the demise of various pollution sources, including historical mining and metalliferous industries, and alleviation of barriers to fish migration. The river now supports substantial populations of salmon and sea trout in addition to resident brown trout.

Fish passage has been eased at Penycae Falls and Beaufort Weir, and fish passes constructed on Panteg Weir and as part of the tidal barrage structure.

A series of studies are currently underway to assess if the barrage is having an impact on migratory salmonid populations. Early indications are that the barrage is hindering the migration of salmon and sea trout. The nature of the fisheries ecosystem within the tidal reach is likely to be influenced in future years by the construction of the barrage.

No commercial fishery or shellfishery exists within the river system. Coastal beach netting is restricted to the winter months to protect migratory salmonid stocks as they enter inshore waters.



ISSUE No: 30			
S105 Surveys to identify the extent of lands liable to flood have yet to be undertaken in the catchment			
Options	Responsibility	Advantages	Disadvantages
Undertake surveys  Programme to be determined in consultation with Local Authorities	NRA	Flood plain and flood defence problems identified to enable NRA to advise Local Authorities for Local Plan preparation	Cost: £20k

ISSUE No: 31			
Flood warning for upper Tawe catchment			
Options	Responsibility	Advantages	Disadvantages
Find site for telemetric river level recorder to relate river levels to flood incidents and implement	NRA	Improved warning to communities in upper catchment	Cost: c.£10k

ISSUE NO: 32			
Sand is being lost from beaches in Swansea Bay			
Options	Responsibility	Advantages	Disadvantages
Studies undertaken in 1993 may provide an explanation of physical process. If not, detailed studies should be undertaken.	NRA/Local Authorities/CCW/Private Interests/DoE	Understanding of process involved  Ability to respond properly to dredging proposals	Cost: unknown

ISSUE No: 33			
Inaccessibility of suitable spawning grounds for migratory fish due to natural and man-made obstructions			
Options	Responsibility	Advantages	Disadvantages
Construct fish pass or easement facilities at high priority obstructions such as Lower Clydach Falls, Capitol Falls, Penycae Falls and Abercraf Weir, and prioritise the easement and creation of access at remaining obstructions	NRA/Local Authority/Riparian Owner	Increased natural productivity with up to 20km of river being made available for spawning migratory fish	Increase in vulnerable poaching area  Cost: c.£100k for the high priority obstructions

ISSUE No: 27 Flood protection standards at Ystradgynlais, Cwm-twrch, Ynysmeudwy, Pontardawe and Clydach			
Options	Responsibility	Advantages	Disadvantages
Study to determine existing standards of flood protection and to identify possible improvement schemes	NRA	Increased flood protection  Reduced flood damage	Cost of study (approx. £30k) and cost of possible solution (unknown)

ISSUE No: 28 Reduction in flood defence standards due to channel sedimentation, bank settlement and catchment development			
Options	Responsibility	Advantages	Disadvantages
Study to determine existing flood defence standards	NRA	Will identify maintenance requirements and assist in planning of maintenance works	Cost: £30k  Resource implications
Investigation to determine existing channel capacity and the impact on flood defence standards of obstruction to flood flows	NRA	Highlights problem areas and allows improvements to catchment management	Study costs unknown

ISSUE No: 29 Property at risk from flooding due to blockages caused by trees carried down river in flood events and bankside erosion problems			
Options	Responsibility	Advantages	Disadvantages
Conduct survey of bankside tree condition in the upper catchment and develop a tree management programme	NRA/Landowners	Reduction in blockage and bank failure  Optimise tree cover within river corridor	Cost: £10k  Impact on riverside vegetation and general aquatic environment



## CONSERVATION

The Tawe catchment area is one rich in flora, fauna and scenic beauty, as demonstrated by the Gower Area of Outstanding Natural Beauty (AONB), Gower Heritage Coast, Brecon Beacons National Park and numerous Sites of Special Scientific Interest (SSSIs). In addition to these, the Glamorgan Wildlife Trust and the National Trust manage several sites and the RSPB owns a reserve along the Lower Clydach. The intertidal mudflats at Blackpill in Swansea Bay provide important feeding and roosting areas for gulls and wading birds.

There are over 50 sites of archaeological interest listed by CADW within the catchment. The majority of these sites are ancient fortifications, earthworks or stones outside the river corridor.

Otters have recently been recorded throughout the main river, and some of the major tributaries. The distribution of this species is expected to increase. Artificial resting and breeding areas (holts) have been constructed to enhance bankside cover for this species. Japanese knotweed is present in abundance in the middle and lower reaches of the Tawe, and the lower reaches of many of the tributaries. This plant causes considerable problems by reducing access to the river and affecting several of the land reclamation schemes which are being carried out in the lower part of the valley.



## RECREATION

The Tawe catchment and surrounding areas are highly populated and it is therefore understandable that there is a high demand for existing and potential recreational sites. These needs are currently met by the provision of country parks, footpaths, cycleways, beach car parks and many well organised special interest bodies such as angling associations and boating clubs. The construction of the barrage, and conversion of South Dock into a marina, has presented new, mainly recreational opportunities.

The catchment area has a high amenity value and is attractive to bird-watchers, pot-holers, climbers and walkers. South Gower has many campsites and is a popular holiday destination for people attracted by the picturesque bathing beaches. Beaches such as Caswell and Oxwich are extremely popular with bathers throughout the summer season. Watersports, including jet-skiing and water-skiing, take place around the coast.

Angling is very popular on the Tawe and its tributaries. Local angling clubs permit fishing for salmonids in some stretches but, although coarse fish are present, they are not fished for in club controlled waters. Several private 'put and take' rainbow trout fisheries have been created and these attract large numbers of visitors. Many lakes are also fished for coarse fish species, particularly popular are those in the Swansea parks.

Boating on the Tawe itself is restricted to the tidal waters of the river, between Beaufort Weir and the barrage. The impoundment and marina complex provide over 600 berths for both local and visiting pleasure craft. Paddle and rowing boats may be hired for use on Singleton Park Lake in Swansea and on the Swansea Canal in Coedgwilym Park, Clydach.

ISSUE No: 24			
There are no low flow measurement facilities on smaller watercourses			
Options	Responsibility	Advantages	Disadvantages
Hydrometric review of the catchment to assess benefits and cost of installing additional flow measurement facilities	NRA	More accurate flow assessment to aid determination of licences and consents	Cost of review: £3k

ISSUE No: 25			
There are no groundwater measurements undertaken in the Towe catchment			
Options	Responsibility	Advantages	Disadvantages
Desk study to determine suitable locations for groundwater monitoring boreholes and implement a drilling programme	NRA	Effective monitoring of groundwater resources and possibly quality  Reduced risk of environmental damage from groundwater abstraction/pollution	Cost: £25k

ISSUE No: 26			
Impact and control of natural movement of gravels in the river channel			
Options	Responsibility	Advantages	Disadvantages
Study to determine what further action can be taken to reduce gravel movement and to minimise impact of that action on the watercourse	NRA	Reduced disturbance by limiting dredging operations to specific sites  Reduced cost of removal and haulage of gravel	Cost and construction of catchpit areas  Environmental impact of dredging operations at those sites



ISSUE No: 20 Low levels of dissolved oxygen in Parkmill Stream below Parkmill WTW			
Options	Responsibility	Advantages	Disadvantages
Investigation into causes of the problem and implement remedial works where appropriate	NRA	Identification and quantification of problem  Short term study	Cost effective solution may not be found  Cost: c.£0.5k

ISSUE No: 21 High ammonia and low dissolved oxygen in the Killy Willy stream below Pennard STW			
Options	Responsibility	Advantages	Disadvantages
Water Quality failure based upon last 3 years data. Situation should improve as a result of the closure of Pennard STW (Oct. 1993). Effluent is now diverted to Southgate STW, but emergency discharge remains which will require monitoring	NRA	Identification of water quality impacts  Water quality should improve as a result of STW closure	

ISSUE No: 22 Potential low flows in Tawe and the Gower streams caused by abstraction			
Options	Responsibility	Advantages	Disadvantages
Desk study to identify if existing conditions do create any low flow problems and, if so, undertake data collection and/or feasibility study of possible solutions	NRA	Increased knowledge of catchment  Protection of the environment	Time involved  Cost: £5k  Cost effective solutions may not be identified

ISSUE No: 23 Potential low flows in the Tawe below Panteg Weir caused by canal abstraction			
Options	Responsibility	Advantages	Disadvantages
Desk study to identify if existing or possible future conditions create or will create any low flow problems, and if so undertake data collection and/or feasibility study of possible solutions, including dialogue with B/WB	NRA	Identification of low flow problems  Protection of the environment	Time involved  Practical solutions may not be identified  Cost: £8k

## NAVIGATION

Public rights of navigation exist in the Tawe only as far upstream as the tidal limit at Beaufort Weir. Swansea Canal is no longer used for commercial navigation purposes. The passage of vessels upstream of the barrage is restricted by the size of the lock, which measures 12.5m by 38m. Several small commercial fishing vessels use moorings within the impoundment. Since the creation of the barrage, these vessels have been able to pass to the sea via the locks at all states of the tide.

The commercial docks at Swansea, managed by Associated British Ports, are not used to the same extent as previously although they continue to serve as an important docking facility for BP shipments. Cargo and passenger vessels visit regularly. There is also a car ferry service operating to Cork, in the Irish Republic, between March and October. In the estuary below the barrage a navigation channel is maintained by dredging to enable the passage of ships entering/exiting the port of Swansea.

## ISSUES AND OPTIONS

The following tables list the issues which the NRA has identified in the Tawe and South Gower catchments. We would like to hear from you if:

- You think that there are other issues which we have missed.
- You think that we have not considered all the options.
- You have any views on the options suggested.
- You have any other information about the catchment or comment about its future management.

ISSUE No: 1			
Poor aesthetic and bacteriological standards in Swansea Bay and many Gower beaches due to sewage/storm sewage discharges and terrestrial litter			
Options	Responsibility	Advantages	Disadvantages
Installation of sewage treatment for Mumbles outfall and improvements of storm sewage outfalls to Swansea Bay Scheme by Dŵr Cymru to be completed by 1997	Dŵr Cymru	Improved bathing water quality and reduction in sewage derived litter	Cost £73m
Improve litter collection/removal at beaches	Swansea City Council or Beach Owner	Improved aesthetic quality (may only be within bathing season)	Cost: unknown

ISSUE No: 2			
Poor aesthetic quality in Swansea Marina			
Options	Responsibility	Advantages	Disadvantages
Improve litter control and collection within the Marina using byelaws. Improve control of boat discharges using byelaws. Investigate the cause of odour.	Swansea City Council	Improvements in aesthetic quality of the Marina and reduction in numbers of complaints	Cost: unknown

ISSUE No: 3			
Low dissolved oxygen in the Tawe impoundment			
Options	Responsibility	Advantages	Disadvantages
Improvements to barrage operating regime to reduce/eliminate stratification upstream of the barrage	Swansea City Council	Improved water quality	Possible limitations on use of the barrage locking facility and hydropower generator during low river flows
Improvements to CSOs discharging to the impounded areas to reduce frequency of spill	Dŵr Cymru	Improved water quality	Cost: >£10k

ISSUE No: 16			
Poorer than expected biological quality in the Twrch			
Options	Responsibility	Advantages	Disadvantages
Investigation into causes of the problem (suspected to be operation of CSOs)	NRA	Quantification of problem and identification of problem sites/ discharges	Investigation costs c.£ 1k
Implement remedial measures at Tycanol tip.	Brecknock Borough Council	Improved water quality of Twrch and nearby Palleg stream	Cost: c.£150k

ISSUES No: 17			
High BOD concentrations on the Nant Cwmdu			
Options	Responsibility	Advantages	Disadvantages
Investigate source of problem and identify remedial measures	NRA	Identity source of problem Potential improvements in water quality	Cost: of investigations:c.£0.5k

ISSUE No: 18			
High levels of BOD in the Swansea Canal			
Options	Responsibility	Advantages	Disadvantages
Investigation into causes of the problem	NRA	Quantification of problem and identification of problem sites/ discharges	Cost of investigations: c.£1k

ISSUE No: 19			
High BOD and total ammonia and low dissolved oxygen in the Clyne due to CSOs and leachate discharges from Clyne Refuse Tip			
Options	Responsibility	Advantages	Disadvantages
Investigation to identify and quantify problem CSOs (see Issue 11) and leachate discharges from Clyne Refuse Tip	NRA	Evaluation of identified problems in order to prioritise improvements (some work already carried out on CSOs by strategy group)	Cost: £2k

ISSUE No: 12			
The Tawe between Trebanos STW and Morrision Road Bridge fails to meet FE Class 1 due to effluent quality from Trebanos STW			
Options	Responsibility	Advantages	Disadvantages
Improvement in effluent treatment	Dŵr Cymru	Improvement of water and biological quality	Cost: c.£300k
ISSUE No: 13			
High levels of BOD, total ammonia and low dissolved oxygen in the Upper Clydach due to leachate discharges from Pwllfawacyn Tip and Abernant Colliery			
Options	Responsibility	Advantages	Disadvantages
Restoration of Pwllfawacyn Domestic Tip	Lliw Valley Borough Council	Improvement of biological and water quality (BOD, ammonia & DO)	Cost: £200k
Improved site management and restoration at Abernant Colliery	British Coal	Improvement of biological quality	Cost: unknown
ISSUE No: 14			
Poor biological quality in the Tawe between Abercraf and the Upper Clydach confluence and also in the Nant Giedd			
Options	Responsibility	Advantages	Disadvantages
Investigation into the cause of the deterioration	NRA	Identification of problem and available remedial measures	Cost: c.£1.5k
ISSUE No: 15			
Poor aesthetic quality on the Tawe at Glais and at other locations of abandoned mines, due to ferruginous minewater discharges.			
Options	Responsibility	Advantages	Disadvantages
Identify as problem in NRA Abandoned Mine Water Strategy	NRA	Identification of appropriate treatment	Cost: unknown, and no immediate improvement
Provide treatment	Mine Owner	Improvement in discolouration	Cost: it is unlikely that the mine owner can be traced. There is no legal requirement to empower improvement.

ISSUE No: 4			
Carbon dioxide releases from sediments around New Cut Bridge in the lower estuary give rise to public complaints and concern because of level changes in the impoundment			
Options	Responsibility	Advantages	Disadvantages
Improvements to barrage operating regime	Swansea City Council	Improved aesthetic quality	Possible limitation on use of barrage locking facility/ hydropower generator

ISSUE No: 5			
High bacteriological and ammonia levels in the Tawe estuary due to combined sewer overflows (CSOs)			
Options	Responsibility	Advantages	Disadvantages
Implementation of improvements to existing CSO	Dŵr Cymru	Improved water quality to achieve contact watersports and fisheries ecosystem standards	Cost: >£10k

ISSUE No: 6			
Failure of the estuary to meet targets for nickel			
Options	Responsibility	Advantages	Disadvantages
Investigation into all possible sources of nickel	NRA	Pinpoint source(s) and effect remedial measures	Cost c.£2k
Reduction in nickel levels from new and previously identified sources	NRA/INCO Europe Ltd.	Improved water quality and reduction in annual metal loading to river in accordance with Red List Reduction Programme	Cost: unknown, but likely to be high

ISSUE No: 7		Elevated levels of metals in the Tawe estuary, Nant-y-fendrod and coastal strip due to contaminated land	
Options	Responsibility	Advantages	Disadvantages
<p>Identification of the principal contaminated land areas contributing to the high levels of metals in order to target and implement remedial work</p> <p>Ensure provision of appropriate comments for development proposals</p>	<p>Land Owners/ NRA /Swansea City Council</p> <p>NRA</p>	<p>Improved water quality</p> <p>Reduction in annual metal loading to the estuary in accordance with Red List Reduction initiative</p>	<p>Cost: unknown, but likely to be large and long term</p>

ISSUE No: 8		Elevated levels of suspended solids, BOD and ammonia and low dissolved oxygen in the Nant-y-fendrod	
Options	Responsibility	Advantages	Disadvantages
<p>Investigation into causes of the problem (suspected to be operation of CSOs)</p>	<p>NRA</p>	<p>Quantification of problem and identification of problem sites/ discharges</p>	<p>Cost c.£1k</p>

ISSUE No: 9 Litter problems in parts of the Tawe and Nant-y-tendrod			
Options	Responsibility	Advantages	Disadvantages
Develop a co-ordinated action plan of litter enforcement with Swansea City Council	NRA/Swansea City Council	Increased public awareness of litter issue and more cost-effective coverage	Cost of enforcement
Develop a co-ordinated litter-pick campaign in conjunction with local groups	NRA/Swansea City Council/ Local Groups	Increased public awareness	Cost: this option alone is unlikely to achieve long term improvement and relies upon goodwill of local groups
Increase awareness of fines for littering e.g. more bankside notices in strategic locations	NRA/Swansea City Council	Reduction in bankside litter and improved amenity	Cost: unknown Difficult to measure effectiveness

ISSUE No: 10 Poor aesthetic quality in the Tawe at Ynysforgan due to foaming caused by the discharge from BSC Felindre			
OPTIONS	Responsibility	Advantages	Disadvantages
Identify the causative agent within the effluent and remove/reduce	British Steel/NRA	Improvement in aesthetic quality of river and improvement in effluent quality	Cost: likely to involve capital and revenue costs

ISSUE No: 11 CSOs causing failure of several parameters in parts of the Tawe, and Lower Clydach.			
Options	Responsibility	Advantages	Disadvantages
Identification and prioritisation of problem CSOs in order to effect improvement of sewerage system by Dŵr Cymru. The CSO strategy should assist in this work	NRA/Dŵr Cymru	Improvement of water and biological quality	Cost of study: £1k Improvement costs: c.£10k