THE PILTANTON BURN

WILD TROUT TRUST ADVISORY VISIT

PREPARED FOR DUNRAGIT ANGLING CLUB BY

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Contents

1. Introduction

The Piltanton Burn is a small watercourse in South West Scotland, that has supported brown and sea trout fisheries (and to a lesser extent a salmon fishery) for many years. The burn is fished exclusively by the Dunragit Angling Club (DAC), who undertake a great deal of the maintenance work associated with the burn. Since 1990, the DAC has been affiliated to the Galloway Fisheries Trust (GFT), who provide scientific advice regarding the burn and also undertake monitoring works on the system.

The DAC approached the Wild Trout Trust (WTT) to request that an Advisory Visit be undertaken on the Piltanton Burn. The WTT has a well established Advisory Visit scheme, which operates throughout the United Kingdom and Republic of Ireland. Through sponsorship and their own contributions, the WTT can support the costs of having a consultant visit a watercourse that provides habitat for wild trout and make recommendations on ways in which that watercourse can be improved for brown trout and/or sea trout. The recommendations in the report are designed to focus on works that will have benefits for local biodiversity as well as promoting sustainable fisheries management.

The DAC has become particularly concerned in recent years regarding the reduction in numbers of adult sea trout that have been caught in the Piltanton Burn. This trend has been observed in sea trout rivers across the Solway region and, as yet, the cause/s of this decline remain unclear. A group encompassing fishery interests from throughout the Solway has recently been set up to share data and investigate what the potential issues might be. This group has highlighted the need for continued monitoring of sea trout numbers.

In June 2007, the GFT visited the Piltanton Burn under the WTT's Advisory Visit scheme. Relevant electrofishing was completed in 2006. The following report aims to firstly detail the environmental requirements of healthy trout populations then provide a comprehensive review of the information available on the Piltanton Burn (both past and present) as well as reporting on the Advisory Visit. The report will also provide recommendations for the future management of the burn.

2. Life History Requirements of Brown and Sea Trout

The brown trout (*Salmo trutta* L.) is a fish that is ubiquitous throughout Europe, North Africa and western Asia. It is present in a large number of running waters and many inland still waters. It is an unusual freshwater fish in that it can have a variable life history, 'choosing' to be either an adult resident in freshwater or becoming anadromous by migrating to sea. The factors that govern the 'choice' to become either a resident trout or a migratory trout has been the subject of fierce debate. It is thought that genetic factors must play a role in encouraging the adoption of a certain life history but that environmental factors also have a role to play. The greater reproductive energy needs of female trout has sometimes been suggested as a cue for migration, with female trout being more likely to fulfil these needs within the estuary rather than the river system. However, it is known that not all female trout will go to sea even when access is readily available which suggests that there must a balance of advantage and disadvantage in undertaking migrations. Whatever life history the trout pursues, it has a good reputation as a sport fish and is known for its fine taste on the table.

Despite differences in life history, the habitat requirements for spawning in brown trout and sea trout are the same. The adult fish spawn in the autumn/winter in small rock and gravel substrates, often in clean, running waters but also in the littoral zone of lakes/lochs. The female fish will excavate a depression within the substrate into which she spawns her eggs which will be fertilised by a male fish and then covered over. This depression is known as a redd and can be recognised by its characteristic shape. The development of eggs within the redd will be determined by water temperature and once sufficient time at a suitable temperature has elapsed, the egg will hatch into an 'alevin'. The alevin stage of the trout is characterised by the presence of a yolk sac which provides all of the nutrients the young fish needs. It is only when the yolk sac is almost exhausted that the young fish will leave the safety of the redd and swim up into the main flow where it will take external foods. The young fish is now known as a 'fry'. In order to ensure that the fry has sufficient resources, it will disperse from the site of the redd and take up a territory which it will defend aggressively against other fish. Fish that fail to feed, or fail to hold a territory, will die. The fish that hold territories will form dominance hierarchies, with the best territories (e.g. those with better food resources, in terms of invertebrate drift) being held by the most dominant individuals. Even then, these territories may be used for feeding by more than one individual at different times of the day, with dominant fish feeding at dusk (when feeding is most profitable due to predation risk being reduced) and subordinate fish feeding at other times. As the fish become larger and older they are termed 'parr'.

The number of young trout sustained by a freshwater habitat is related to that habitat's quality and variability. The different life stages of trout have different habitat requirements. Fry generally prefer shallow water (less than 20cm in depth) with parr being found in deeper water. Trout fry tend to prefer velocities of 25cm/sec or less with older fish choosing even slower water than this. The avoidance of predators and extremes of temperature are related to both the amount of fish cover present and water depth available. Fish cover is provided by instream substrates, instream/bankside vegetation, undercut banking, woody debris and, occasionally, man made debris, which inadvertently enters the watercourse (e.g. road signs etc.). In terms of chemistry, trout require waters that contain more than 9mg/L of oxygen and pH values below 5.0 are harmful to fish. The level of suspended solids in the water can also affect trout. Direct effects on the trout include damaging delicate gill membranes or causing skin abrasion

which may lead to secondary infections. Indirect effects include silts infilling intergravel spaces which may result in reduced habitat for invertebrates (upon which the trout feed) and compacted substrates which may be difficult for adult trout to mobilise during spawning.

3. The Piltanton Burn – An Overview

3.1 River system

The Piltanton Burn is a small watercourse situated near Stranraer in South West Scotland. The burn rises to the west of Stranraer and flows east until it enters Luce Bay near Dunragit. The burn is tidal in its lower reaches (see **Appendix 1** for map).

In 1988, the Land Cover of Scotland survey indicated that the landcover within the Piltanton catchment was predominantly arable crops with grassland, horticulture and forestry also being important in terms of land use. Arable ground was mainly used to support the production of forage foods and much of the grassland had been reseeded and improved to provide grazing for dairy cattle. Pockets of semi-natural vegetation were scattered within the agricultural land. A small amount of urban landcover was also present within the catchment. Land cover within the catchment remains similar today, although established river margins now add to the amount of natural vegetation present within the catchment. A wind farm development (the North Rhins Windfarm) is also planned for the area surrounding Stranraer but recent indications are that turbines will not be situated within the Piltanton catchment.

The agricultural nature of the catchment (in particular the rearing of livestock) means that there has been potential for man's activities to affect the burn. Past land management practices have changed the natural course of some parts of the burn, with areas having been straightened or dredged as part of a drainage scheme. This has resulted in some parts of the catchment having little in the way of variation in instream habitat. Livestock have been able to access the burn without impediment, as the burn represents the main livestock watering facilities available. In the past, grazing adjacent to the burn decreased the availability of bankside cover and reduced the burn's buffer zone. Buffer zones are essential in disrupting the path of diffuse pollutants from land to watercourse. Associated with the lack of buffer zone, nutrients in the burn also increased above their natural levels, due to the run off of artificial fertiliser and manure from the surrounding fields. Recent fencing works and tree planting programmes undertaken by the GFT and DAC have aimed to re-establish these riparian areas and recreate buffer zones.

The importance of livestock rearing to the catchment also affected the burn in other ways. In 2001, the Foot and Mouth outbreak led to access being restricted in large parts of the catchment. This had implications for some environmental monitoring, which was unable to be undertaken due to lack of access.

3.1.1 Water chemistry

Pollution incidents were a regular occurrence in the past and contributed to overall poor water quality within the catchment. Pollution was both direct and diffuse and was often linked to agricultural activities within the catchment. In terms of cattle production, one of the greatest potential problems is the spillage of silage liquor, milk or slurry. These pollutants can have serious effects on watercourses, by lowering the oxygen levels available within the water. Silage liquor has a polluting load 200 times that of raw sewage and spillages can be particularly serious.

Whilst pollution events are known to have affected the catchment since the mid 1980s, the most dramatic pollution incident occurred on August the 13th 1990, when slurry entered the burn upstream of Lochans causing a widespread fish kill. The timing of the fish kill was critical as the pollution event occurred at a time when many adult sea trout had re-entered the burn in advance of spawning. A large number of adult and juvenile sea trout and brown trout were killed, with some salmon and eels also being affected by the incident. Following the pollution, Dr Alistair Stephen (Biologist to the West Galloway Fisheries Trust) reported that above Barnultoch Bridge (see Appendix 1) there was no freshwater life left and that parr were confined to a small area of the Drumflower Burn. The Solway River Purification Board (SRPB) report in 1993, stated that pollution problems were indicated from the poor fish and invertebrate fauna present within the burn and that the pollution was almost certainly agricultural in source.

In 1996, the regional River Purification Boards were replaced by a nationwide agency, the Scottish Environment Protection Agency (SEPA). SEPA were charged with being Scotland's environmental regulator and advisor, controlling pollution as well as protecting and improving the Scottish environment.

In their 1999/2000 Annual Report, SEPA states that a significant deterioration had been detected in the Piltanton Burn which was suspected to result from toxic agri-chemical inputs and diffuse organic pollution. Investigations were ongoing to ascertain the cause of the problem at the time of report production. In the same report, a pollution incident involving slurry was also mentioned. The slurry spill had killed fish in a 3km stretch of burn, in the mid reaches of the system around Dunbae Farm. Whilst the ecological impact of this spill was very serious, the GFT were able to secure compensation for DAC for fish that had been stocked into this area and were affected by the fish kill.

In 2001/2002, the National Water Quality Classification report stated that some parts of the Piltanton had been downgraded in SEPA's water quality classification. At Crailloch Croft, increased biochemical oxygen demand (BOD) levels (indicative of organic pollution) caused the water to be downgraded from a 'B' to a 'C' classification. The impacting factor here was said to be cattle in the burn. However, at Lochans the burn's classification was upgraded from a 'C' to a 'B' due to long-term improvements in water quality. The area around Lochans was thought to have been affected periodically by the Waste Water Treatment Works and the improvements in water quality may be related to improvements here.

In 2002, Piltanton Burn's water quality was stated to fluctuate between a 'C' and 'B' status in the National Water Quality Classification report. SEPA pledged to endeavour to stabilise the burn and help the system achieve its best possible water quality.

In SEPA's 2004 National Water Quality Classification report, it was reported that sections of the Piltanton Water catchment had improved from class C to B. All point source discharges, as the primary cause of pollution, had been inspected with actions agreed. However, the impacts from diffuse runoff arising from the extensive agricultural land area coupled with topography still required consideration. In SEPA's opinion, the main pressure in the catchment arose from livestock having direct access to watercourses. SEPA had been liaising with farmers in the area and promoting good practice, which resulted in a noticeable improvement in water quality.

The Piltanton Burn was designated as a sensitive area for the Urban Waste Water

Treatment Directive in 2006.

3.1.2 Biological monitoring

As part of their regular monitoring programme, SEPA undertakes a programme of invertebrate sampling on the Piltanton Burn. To ensure that the samples accurately represent the natural variation in seasonal abundance of invertebrates, data are collected in two seasons and combined. To ascertain whether the invertebrate population in the burn is environmentally stressed, the sample data are then compared to information generated by the River Invertebrate Prediction and Classification System (RIVPACS). RIVPACS is a computer model that predicts the macroinvertebrate fauna that would be present in a site (if it was unaffected by environmental stress), by comparing the characteristics of the sample site to reference sites whose invertebrate communities are already known.

The biological quality data collected at a site are combined with the water chemistry data to give the Water Quality Classification for that site.

Biological Quality Classification results were requested from SEPA and are shown in *Figure 3.1.2*. Data were not available for all years or sites.

From the data provided, it is clear that there has been a general improvement in the invertebrate community of the burn over the referenced time period. In 1995, the two sites for which data were available were classed to be ‘poor’ and ‘fair’. The same sites were classed to be ‘fair’ and ‘good’ during 2006’s sampling programme. It is interesting to note that the Chlenry Burn has consistently been classified as ‘excellent’ in terms of its biology during the period for which data were provided.

3.2 Surrounding environs

Luce Bay was designated as a Special Area of Conservation (SAC) in 2005 for its important dune, seashore and seabed habitats that support a wide variety of plants and animals. The Bay is well used in terms of recreation, with sailing and recreational fishing being popular. The Bay has also been important in terms of its inshore fisheries for shellfish. In recent years there have been reports of demersal trawlers and ‘supercrabbers’ fishing within the bay, which has greatly concerned local fishermen. Whilst the Piltanton Burn itself is outwith the SAC designated area, the activities within the bay have the potential to affect the system.

Figure 3.1.2: SEPA/SRPB Biological Quality Classification results for 1995 and 1998-2006 on the Piltanton Burn (A1 - Excellent; A2 - Good; B - Fair; C - Poor; D - Seriously Polluted; U - Unclassified)

Site	Grid ref	2006	2005	2004	2003	2002	2001	2000	1999	1998	1995
Piltanton Burn, U/s Crailloch Croft	NX 048 589	A2	A2	A2	A2	A2	B	A2	B	B	B
Piltanton Burn, 100m d/s Lochans S/W	NX 068 565	-	A2	B	B	-	-	-	-	-	-
Piltanton Burn, Near B7077 (Galdenoch Br)	NX 092 562	B	B	B	B	B	B*	B	A2	B	C
Chlenry Burn, at Drumflower	NX 139 578	A1	A1	A1	A1	A1	A1	A1	A1	A1	-

3.3 Dunragit Angling Club

Dunragit Angling Club (DAC) was formed in 1975, primarily as a vehicle by which the rent for fishing the lower river could be raised. Before 1975, the land bordering the lower Piltanton (around Genoch Mains) was managed as an estate by the Department of Agriculture and Fisheries (Scotland). When the estate was sold in 1975, the DAC entered into an agreement with farmers who purchased the land. In return for fishing access, the DAC paid the rent and undertook maintenance as required.

The club had a large membership which was maintained until the early 1990s, when numbers started to decrease. It is thought that the decrease in member numbers was affected by the pollution incidents that were experienced around this time as well as the belief that fish numbers could not recover from such catastrophic events. In more recent times, it is thought that the older age profile of the club may partially explain why numbers have been declining. As members become too old to fish, they are simply not being replaced by younger enthusiasts. However, the reduction in catches has undoubtedly reduced the number of anglers fishing the burn and is likely to be the most dominant factor in explaining the decrease in member numbers.

3.4 The fishery resource

The Piltanton Burn was renowned as an excellent fishery in the 1960s and 1970s. In those days, large brown trout were caught regularly with some sea trout being captured each year. Salmon were largely absent from the catchment with adults caught very occasionally. Eels were abundant and large specimens were captured.

In the 1980s, the burn's reputation for sea trout came to the fore. Members of the recently formed DAC caught many sea trout and herling and, whilst there are no official catch records for this time, anecdotal evidence from DAC members suggests that the system was extremely productive. In August 1990, slurry entered the burn and had a devastating impact on the burn's fish populations.

Vast numbers of dead fish were pulled from the water by DAC members (see *Figures 3.4.1* and *3.4.2*), with both adults and juveniles affected. This was seen to be a critical event in the Piltanton Burn's fishery history as, after this time, adult sea trout have not been as abundant within the system. Eels have rarely been captured since this pollution event.

Figure 3.4.1: Some of the sea trout removed from the burn following the 1990 pollution incident

Figure 3.4.2: A large sea trout removed from burn following 1990 pollution

Rod catch information is available for some years and is detailed in *Figure 3.4.3* for migratory salmonids (sea trout and salmon) and in *Figure 3.4.4* for brown trout.

Figure 3.4.3: Catch data for migratory salmonids caught in the Piltanton Burn, provided by DAC

Year	Number of sea trout	Average weight	Number of salmon	Average weight
1987	202	-	4	-
1990	88	-	6	-
1995	39	1lb 2oz	3	6lb 1oz
1996	21	2lb	2	6lb 12oz
1997	34	1lb 15oz	2	6lb 6oz
1998	38	2lb 12oz	0	-
1999	40	2lb 5oz	1	6lb
2000	-	-	-	-
2001	28	2lb 4oz	2	6lb 2oz
2002	60	2lb 7oz	1	5lb
2003	22	2lb 1oz	-	-
2004	24	-	1	4lb
2005	-	-	-	-
2006	28	-	5	4lb – 5lb 10oz

Figure 3.4.4: Catch data for brown trout caught in the Piltanton Burn, provided by DAC

Year	Number of brown trout	Average weight
1990	14	-
1995	21	14oz
1996	12	-

The rod catch data indicates that there have been some notable changes in the fishery since 1987. There appears to have been a general decline in the numbers of sea trout that have been caught in the burn since records began. Certainly, in the time period between 1987 and 1990 there was a decline of 50% in the rod catch, which suggests that there was a marked change in the number of fish available for capture, assuming that angling effort remained the same over this time. Numbers of sea trout captured have never again exceeded the number caught in 1990 suggesting that this may have been a critical moment in the history of the fishery. Over the last ten years, the rod catch has occasionally improved (2002 being a particularly good year) but in general average rod catch has been around 30 fish. In comparison to 1987's rod catch, this represents a catch of only 15% of the 1987 catch which also means that catches have declined by 85% of the 1987 baseline. Whilst the rod catches indicate that there has been a severe decline in the number of sea trout being caught, as with all rod catch data there are biases/other factors which must be considered when interpreting the information. Rod catch data can be affected by reporting errors, where catch returns are not submitted at all or in some cases false information is submitted. Submission of catch returns is known to have been poor in 2003. Angler skill and angling effort (time spent fishing) may also vary over the years and if this is not measured, it can also lead to the collection of data which is not representative of the river system. Furthermore, variations in environmental conditions or fish catch-ability can also compound rod catch data. It is known that the number of anglers fishing the DAC water has decreased since 1987 and therefore the catches would have been expected to reduce in line with this reduction in fishing effort. However, the magnitude of the reduction in catches does suggest that there has been a change in the availability of fish rather than simply a reduction in effort. This is especially true in light of the decreases in sea trout numbers that have been recorded throughout the Solway region in recent years.

There also appear to have been changes in the timings of the sea trout fishery. In 2001, the highest numbers of sea trout were caught in September and October, whilst in 2002 most sea trout were caught in August. In 2006, it was reported that only three sea trout were caught in October although many smaller fish of around 1lb in size (herling or finnock) were also reported during this month.

Salmon have been caught in low numbers throughout the period for which records are available, with the exception of 2000, 2003 and 2005. The low gradient of the system is probably one of the factors that inhibits the establishment of a larger salmon population within the burn. Whilst there are some areas of faster water and larger instream substrates, most of the catchment is dominated by slower flows which are less favoured by salmon. The tendency towards smaller spawning substrates and slow moving areas surrounded by draped vegetation within the Piltanton Burn means that instream habitat is generally more suited to trout. In recent years, grilse have been caught by anglers fishing in August and grilse have also been caught in the fish trap into November.

Data for brown trout rod catches are patchy but suggest that good sized brown trout are

caught regularly within the system. Unfortunately, there are not enough data to ascertain whether the size of brown trout captured has changed or whether there have been alterations in the number of fish caught. It is also important to state that brown trout are not always declared in catch returns, as there is no legal obligation for them to be declared in official returns for the fishery.

3.5 Fish trap

Since November 1996, the DAC has run a fish trap on the Chlenry Burn, which is a tributary of the Piltanton that enters the burn in its lower reaches. A proportion of the fish captured in the trap were used as broodstock and their progeny were ongrown to the fed fry stage in the GFT hatchery before being stocked back into the burn. Given the burn's history in terms of pollution, the availability of fry to restock areas affected by pollution has been vital in efforts to maintain the burn's fish populations. At the start of the fish trapping project, around 30-40,000 eggs were laid down each year from broodstock. In recent years, however, the number of eggs has reduced to around 15,000 due to a decrease in broodstock availability.

The number of fish captured in the trap provides a good indication of fish numbers available at that point within the system (*Figure 3.5.1*). Environmental conditions could, however, play a significant role in fish trap catch. If water levels are too low, fish may not be able to reach the trap whilst high water levels may allow fish to bypass the trap by swimming over it. Temperatures may also play a role in fish trap efficacy, with temperatures below 5 degrees reducing swimming ability.

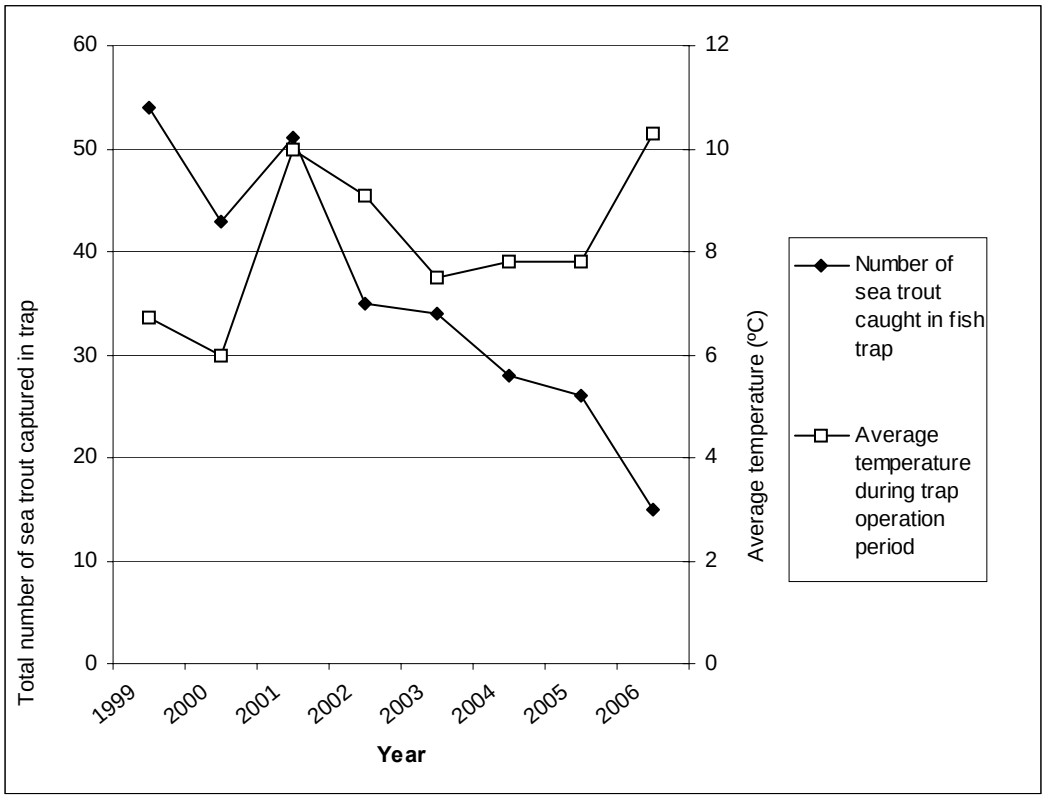
Figure 3.5.1: Fish trap data for trap on Chlenry Burn, provided by DAC

Year	Date trap actively fishing	Date of first capture	Date of last capture	Total number of sea trout caught
1996	11/11	14/11	23/11	9
1997	05/11	12/11	20/11	14
1998	15/11	19/11	27/11	33
1999	10/11	13/11	17/11	54
2000	02/11	4/11	20/11	43
2001	13/10	16/10	30/11	51
2002	03/10	15/10	15/11	35
2003	20/10	1/11	21/11	34
2004	18/09	10/10	4/12	28
2005	08/10	21/10	4/12	26
2006	04/10	10/10	27/11	15

To investigate the potential role of temperature in affecting the numbers of sea trout caught in the trap, the number of sea trout captured was plotted against the average temperature during the trapping period (*Figure 3.5.2*). Although no temperature data were available for the Piltanton Burn, data are available for Torhouse Trout Farm which is situated approximately 15 miles to the west of the Piltanton Burn. The trap was not operated during the same time period during the 10 year period for which data are available, with the trap being fished earlier in recent years. This was undertaken to ensure that sufficient fish were captured as broodstock. This variation in trapping time is likely to have caused some temperature increase over the time that the trap has been

operated.

Figure 3.5.2: A graph showing the number of sea trout caught in the Chlenry Burn fish trap and the average water temperature during trap operation time



The earlier trapping periods in recent years in comparison to earlier years are likely to partially explain the increased average temperature profile over time. However in 2004, during the earliest trapping period, the average temperature rose only slightly and did not exhibit the large change that might be expected from initiating the trapping operation almost one month earlier than the previous year. However, 2004's trapping period was also significantly shorter than the other trapping periods and this may mean that the average temperature for this trapping period is less comparable. The average temperature during the trapping period in 2006 was the highest during the period for which data is available but the total number of sea trout caught was only 60% of the previous year. In recent years trapping has commenced earlier but fewer fish have been captured. This strongly suggests that less fish are available for trapping within the system for some reason. It is widely believed that increases in temperature may have contributed to the current decline in sea trout numbers in the Solway. Possible mechanisms by which temperature increases could affect sea trout include changing food webs within the estuary, or increased stress (due to increased temperature) which may lead to increased susceptibility to disease. However, further research is required before conclusions can be made.

It is difficult to make direct comparisons of fish capture between the years as trapping periods have varied. The time at which trapping commenced and the time at which trapping ceased may have been informed by previous experiences (e.g. in the previous year, 'few' fish were captured and therefore the trap was put in earlier/left longer during

the following year). It is also possible that time pressures upon the DAC volunteers running the trap may affect the trapping initiation and duration of trapping. The variation in trapping periods does mean that comparisons are difficult. However, viewing the data for 1999 in comparison to data collected in 2004/2005/2006 strongly suggests that there are less fish available. In 2004/2005/2006 the trapping period began earlier but ran for longer than in 1999 yet far fewer fish were caught.

3.6 Electrofishing surveys

The GFT has undertaken annual electrofishing surveys on the Piltanton Burn since 1990. A total of 8 sites are electrofished on a regular basis. The results of these surveys are summarised in **Appendix 2** with detailed information on 2006's survey provided in **Appendix 3**.

The summary data provided in **Appendix 2** indicates that densities of juvenile trout in the 2006 survey were lower than had been previously recorded. For the first time, neither fry nor parr were found in 'high' density classes at the electrofishing sites, although variation in stocking practices between years can cause significant variation in fish numbers.

Looking at the actual numeric data for previous electrofishing surveys provides further detail:

<u>Site 1 – Downstream of bridge at Greenfield</u>
During 2006's survey, a low density of fry was recorded whilst parr were entirely absent. This contrasts with the situation in 2005, where both fry and parr were recorded but is similar to the data recorded in 2003 and 2004.

In general, juvenile trout are present in low densities at this site although densities of fry have improved in recent years. As this is the highest site on the main burn, the numbers of adults reaching this site may be affected by access problems lower in the catchment.

<u>Site 3 – Upstream of Lochans village</u>
During 2006's survey, trout fry were found in a low density whilst parr were found in a moderate density. This is broadly the same picture as has been recorded at this site over the duration of the GFT electrofishing surveys, with the exception of the early 1990s and 1995.

This site is quite deep and is not as well suited to spawning as other sites. This may account for the low density of fry recorded here. However, the draped vegetation and deep nature of the site provides a better environment for parr.

<u>Site 4 – Between Lochans bridge and sewage works</u>
In 2006, a moderate density of trout fry and a low density of trout parr were recorded. In general, better densities of fry than parr are usually recorded at this site. Juvenile trout have only been absent from this site in the early 1990s and in 1995.

This site has quite a variety of flows and depths within it and provides good instream habitat for trout. The low densities of trout parr at this site may be related to the presence of better parr habitat in the vicinity of the site.

Site 5 – Upstream of Culmick at Bridgebank

During the 2006 survey, a moderate density of trout fry and a low density of trout parr were recorded at this site. This is broadly the same situation as has been found previously. This site is stocked regularly as part of the Piltanton Burn stocking programme and the stocking is likely to account for the periodically high densities of fry that are recorded at this site.

Site 8 – Chlenry Burn, downstream of Chlenry Farm

During the 2006 survey, a moderate density of trout fry and parr were recorded. In general, densities of fry tend to be better at this site than densities of parr. Trout fry and parr have always been present at this site since surveying began. As this burn is a tributary of the Piltanton Burn, it has not been detrimentally affected by the point and diffuse pollution events that have affected the main burn over the years. The site tends to be more suited to fry than parr in terms of depths and flows. Adult trout have been seen spawning within the site.

Site 9 – Chlenry Burn, under the A75

Densities of trout fry and parr were recorded as being moderate at this site during the 2006 survey. Fry are usually present in high numbers, although lower numbers have been recorded periodically. Since 2004, there has been a sustained period of lower fry densities recorded. The moderate density of parr recorded in 2006 also represents a departure from previous surveys, where parr have almost always been recorded in high numbers (with the exception of 2001).

This site is situated only a short distance from the main Piltanton Burn and access is not thought to be an issue. The fish trap is situated on this burn and it is interesting to note that the lower fry densities in recent years correspond with lower numbers of adult fish in the trap.

4. Current Status

In order to evaluate the current status of the Piltanton Burn, an Advisory Visit was undertaken. Mr Robert McCreadie of the DAC was present during part of the Advisory Visit to focus interest on areas where the DAC had particular concerns. The following section records the current status of the Piltanton Burn and suggestions for further action are provided in **Section 5**.

The visit was undertaken on the 6th June 2007.

4.1 Burn diversion

Mr McCreadie stated that the DAC had interest in investigating whether works could be undertaken on a section of the lower burn. The area in question (NX 215300 556400) used to be part of the main channel of the burn but a diversion had been created around ten years ago. The burn was diverted as the original channel meandered through a field, effectively dividing the field and reducing its farming potential. The farmer infilled a section of burn at the start of the meander and then created a new channel to join the two closest points of the meander. The downstream section of the meander was blocked with boulders but on a spring tide, the water rises above the height of the boulders and floods part of the old channel. It was anticipated by DAC that the old channel would be infilled to allow the land to be used for farming. However, Scottish Natural Heritage (SNH) objected to the development and the old channel remains in place. The DAC would like to investigate whether it would be possible to reinstate the original channel. This would involve removing the earth infill in the old channel, infilling the newly created diversion section and then diverting the water back into the old channel.

Figure 4.1.1: Upstream section of meander

Figure 4.1.2: Downstream section of meander

Since the works on this burn section were originally undertaken, new legislation has been introduced regarding undertaking engineering works in rivers. The Water Environment and Water Services (Scotland) Act 2003 (or WEWS) gave Scottish ministers powers to introduce regulatory controls over activities in order to protect and improve Scotland's water environment. These regulatory controls – the Water Environment (Controlled Activities) (Scotland) Regulations 2005 – were passed by the Scottish Parliament on 1 June 2005.

The Controlled Activities Regulations (CAR) regulate a variety of activities, which it is illegal to undertake without an appropriate authorisation from SEPA. The engineering works undertaken on the Piltanton Burn in creating this diversion would be subject to CAR if they were to be undertaken in the present day. However, it is unlikely that the works would be permitted now as they involve the partial destruction of a riverine habitat in direct contravention to best practice guidance and certainly in contradiction to the Dumfries and Galloway Local Biodiversity Action Plan (LBAP).

To investigate whether there is a possibility of undertaking remedial works on this section of the burn, a variety of different parties would need to be consulted. Firstly the landowner would need to be amenable to repairing the work. As the field is currently not used for crop or livestock and is filled with tall vegetation, it is possible that the landowner would be amenable to undertaking some works in this area. It may be possible to suggest a reinstatement solution which would also provide some benefit to the farmer in terms of providing some land adjacent to the burn for farming activities. However, it is important to ensure that reinstatement works aim to provide the highest possible quality habitat and the burn must be protected from activities that may detrimentally affect it (such as grazing of the riparian zone). SEPA and SNH would also need to be consulted regarding this proposal. SEPA may decide that the potential environmental effects of removing the earth infill from the old channel and infilling the new channel outweigh the benefits of reinstating approximately 80m of original channel. Certainly the mobilisation of sands and silts could cause siltation downstream and

careful engineering considerations would be needed in ensuring that the infilled area within the new channel is stable enough to persuade the burn to follow its previous route. SNH may also have concerns regarding possible reinstatement works both from an environmental damage perspective and a biodiversity perspective. Whilst the old channel is not currently useful as fish habitat, the wetland area and natural stands of vegetation that have developed are important in supporting other flora and fauna. There may be a possible reduction in biodiversity if the old channel area was to become inundated with water again and this would also need careful consideration in any reinstatement proposal.

The benefits of reinstating the old channel from a fisheries perspective should also be reviewed. The area in question currently floods under spring tides and this would continue to be the case if the old channel was reinstated. This means that the area would not be of benefit to spawning fish as salmonid eggs laid in saline environments are not viable. The channel would probably have a role to play in terms of providing additional habitat for older parr who are beginning their seaward migration but this would be quite a transient use of the habitat. There are some pool areas in the old channel which may be useful as holding areas for adults, if the area was re-flooded.

4.2 Visit to sites of previous habitat works

The sites of previous habitat works completed by GFT/DAC were visited. Grazing of banksides is a particular problem in some parts of the Piltanton catchment, especially in areas where draped vegetation provides almost all of the fish cover. In these areas, lack of vegetation can result in increased erosion and silt mobilisation as well as reducing shade within the water. In 2001, a 1km section of the lower Piltanton around Drochduil was fenced by GFT to prevent livestock from accessing and grazing the riparian zone. Additionally, native broadleaved trees were planted within the fenced area to stabilise banksides, increase canopy cover and provide a source of terrestrial invertebrates as food for trout inhabiting the burn. Trees were planted with treeguards as deer are present in this area. This work was part funded by SNH and Scottish Power Rural Care Fund and was supported by the landowner, DAC and GFT.

Upon visiting the area, it became clear that fencing had greatly improved the riparian zone. A range of grasses and understorey plants are now present, with some shrubs also becoming established. Grasses now provide bankside cover for trout. The broadleaved trees that were planted have flourished. The benefit of this improved buffer zone to the burn cannot be overemphasised enough. Whereas previously, the riparian zone consisted almost entirely of bare earth, which did little to disrupt the path of runoff into the burn, there is now an established area of complex vegetation to remove any nutrients that may be present.

Figure 4.2.1: Fencing and tree planting

Figure 4.2.2: Fencing and tree planting upstream of Forestry Pool

Just downstream of Forestry Pool, cattle have access to the water. The geology in the Piltanton catchment is dominated by sand and therefore water is not retained particularly well. Watering holes, that use the burn as a source of water, are often the only way to water livestock in this area. There are obvious environmental benefits in preventing cattle from accessing the water but where there is no alternative, farmers currently have little choice. Recent figures suggest that up to 1400 cattle are present in fields adjacent to the lower burn, all of whom require water. Finding a low cost, environmentally

beneficial solution to the stock watering issue in the Piltanton catchment could have a huge impact on the biology of the system. In developing a solution, it is of critical importance to ensure that landowners are supportive of the scheme and are engaged in the consultation process. Historically, a range of different stock watering techniques have been attempted in the catchment, some being more successful than others. Developing a watering solution that would reduce the need for cattle to enter the burn at all would seem to be the best option. GFT are presently investigating possible solutions in a separate report.

Figure 4.2.3: Watering hole downstream of the Forestry Pool

A further site visit was undertaken downstream of Drochduil. Fencing had been erected in this area in 2005, again to reduce the impact of cattle grazing banksides. From the site visit, it was observed that fencing had greatly improved the riparian zone in this area, with tall herbs and grasses having become established. At the current time, the field is being used to grow maize and therefore livestock pressure is currently not an issue. However, the legacy left by previous livestock is still evident (*Figure 4.2.5*) in an area where cattle have previously accessed the burn for water. The burn has become shallow at this point, due to the area having been repeatedly trampled and silt having entered the watercourse. The riparian zone is becoming more established but is clearly not as stable as other parts of the burn that have not historically had this pressure.

Figure 4.2.4: Downstream of Drochduil bridge, where fencing was erected in 2005

Figure 4.2.5: Newly fenced area where livestock have historically accessed burn

4.3 Other site visits

Site visits were undertaken elsewhere in the burn catchment, to ascertain current status and whether improvements were necessary. These visits were taken following rain the

previous day and the water level in the burn was considered to be above normal summer flow.

4.3.1 Chlenry Burn

The lower reaches of the Chlenry Burn were visited, adjacent to Drumflower Farm. The burn was judged to have a predominantly sandy substrate, with some areas of gravel. Woody debris was recorded instream. Bankside vegetation consisted of tall herbs and grasses on the right bank (when facing downstream). A house and gardens were present on the right bank and a pipe was seen to be discharging from this area. On the left bank, bankside vegetation was dominated by hawthorn bushes and broadleaved trees (sycamore) were present on the bank top. The combination of bushes and trees led to the burn being classed as overshaded and some selective removal of branches overhanging the burn may be beneficial. The field adjacent to the burn contained horses and the fence in this area was in disrepair. It may also be beneficial to repair this fence.

It appeared from the site visit that the burn may become less overshaded upstream. It is recommended that a habitat survey of this burn is undertaken to determine the current habitat quality.

Figure 4.3.1: Lower reaches of the Chlenry Burn, showing overshading

4.3.2 Piltanton Burn, at Barnultoch Bridge

The area of the burn around Barnultoch Bridge was visited as this part of the catchment is believed to be one of the main spawning areas in the main Piltanton Burn. The water was deep in this area, as evidenced by the fact that DAC fish this part of the burn. The area visited was most suited to adult trout and there were some good holding areas. Instream vegetation was present within the burn (mainly broadleaved pondweed, *Potamogeton natans*) and this is likely to be important as fish cover within the central

part of the channel, given the depth of the site. Both sides of the burn were fenced. Dense vegetative cover was present on both banksides, with tall herbs being abundant and a smaller amount of low level shrubs. This bankside vegetation provided draped cover for fish over the majority of the area visited.

Downstream of the bridge, SEPA have a water quality monitoring station. Japanese knotweed (*Fallopia japonica*) was recorded downstream of the bridge and it is suggested that an appropriate control programme is initiated to prevent this invasive plant from spreading further downstream.

Figure 4.3.2.1: Upstream of Barnultoch Bridge

Japanese knotweed is known to affect river banksides in a number of ways. Firstly, it reduces the diversity of the banksides by outcompeting native plants, due to the fact that it can develop dense stands very quickly once it becomes established. Furthermore, the stands that are formed offer a poor habitat for native insects, birds and mammals. In the riverine corridor, it is particularly harmful as the foliage dies back on a seasonal basis reducing the 'anchoring' and stabilising role that bankside vegetation performs. That this happens during the winter months when flood events are more prevalent causes further environmental degradation as erosion increases.

The plant is very easily spread, with new stands developing from tiny fragments of the original plants. It is vital that the plant is controlled as soon as a stand becomes established.

Figure 4.3.2.2: Downstream of Barnultoch Bridge. A stand of Japanese Knotweed can be seen on the left bank (facing downstream)

4.3.3 Piltanton Burn, at Bridgebank

The area of the burn around Bridgebank is also within the area that is believed to be important for spawning. The main burn downstream from Bridgebank to Culgrange Farm was visited.

In general, this area was considered to provide good habitat for trout. Banksides have been fenced and cattle do not have access to the burn. Only at one field boundary (NX 208100 556600), where a small field drain enters, was there any potential for cattle to impact the water quality. Tall herbs/grasses and established mid-storey vegetation are present throughout the area and provide a good buffer zone that is on average 3-4m in width. Mid-storey vegetation is generally closer to the bank top than tall herbs/grasses. During the winter months, bankside vegetation is unlikely to contribute as much to fish cover at this site.

The burn is generally slow and deep throughout the section visited and is probably important as a holding area for adult trout. At NX 208200 556700 a small weir (which appeared to have been constructed of wood and stone) had been placed across the river. The structure then sloped downstream and over this section the flow was faster. It is not clear what was the purpose of this structure. At the time of the site visit, water was slightly above normal summer levels following rain the previous day. It did not appear that this weir would present a problem to migrating adults.

During the site visit, 3 herons were seen to be emerging from an area adjacent to the burn near Culgrange Farm. This strongly suggests that fish are abundant in this area.

Figure 4.3.3: Weir downstream of Bridgebank

4.3.4 Garthland Burn

The Garthland Burn was also visited during the site visits. This burn has previously been stocked as part of the DAC/GFT stocking programme. The main burn was visited, downstream of the road end at Kilbreen Farm.

The bankside vegetation of the burn was well established, with draped vegetation being present. Tall herbs and grasses dominated the banksides and due to the seasonal nature of these plants, it is likely that bankside cover is greatly reduced at this site during the winter months. In some places, the vegetation provides complete cover over the water which is related to the burn's narrow width. The encroachment of vegetation could restrict light penetration to the burn. It may be useful to manage the bankside vegetation selectively on this burn and it may be worth considering planting a low density of native broadleaved trees, which will eventually assist with vegetation control by shading. Neither bankside was fenced, but it appeared that the fields adjacent to the burn were not actively being farmed.

Upstream of the bridge a metal screen was partially blocking the burn. It is suggested that this screen is removed as it will undoubtedly act as an attachment area for waterborne debris.

Figure 4.3.4.1: Upstream of the bridge on the Garthland Burn

Figure 4.3.4.2: Downstream of the bridge on the Garthland Burn

Figure 4.3.4.3: Metal screen upstream of bridge

4.3.5 Crailloch Burn (upper Piltanton Burn)

Crailloch Burn was visited in the area around Crailloch Croft. This is the area that has previously been downgraded in terms of its Water Quality Classification, due to the presence of livestock within the burn.

At the time of the site visit, it was evident that livestock in the field adjacent to the left bank (when facing downstream) had been using the area nearest the road as a watering hole (*Figure 4.3.5.1*). The burn was shallow in this area and erosion was clearly occurring. The burn is not fenced at this point and therefore livestock are able to access the burn without issue (*Figure 4.3.5.2*). This is another area where a stock watering solution is required.

Further upstream, livestock from the field on the right bank of the burn were grazing in the bankside margins of the burn. Both cattle and sheep were seen to be grazing in this area. It is strongly suggested that this area is fenced and an alternative means of watering the stock is considered in this area. It may be useful to fence this area to exclude cattle but allow sheep to access the burn margins. This is suggested as the burn is quite narrow at this point and its productivity may be reduced by allowing tall herbs and other vegetation to encroach across the burn. By excluding the cattle but not sheep, some low understorey vegetation will become established whilst the lower grazing pressure of the sheep will prevent taller vegetation from becoming established and blocking out light.

Figure 4.3.5.1: Watering hole

Figure 4.3.5.2: Livestock grazing burn margins

5. Future Works

The review of data available on the Piltanton Burn and the site visits have highlighted some actions that could be undertaken in the future to benefit the burn. The following section aims to summarise the findings of this report and make recommendations for the future where appropriate.

5.1 Water quality monitoring – chemical and biological

From the chemical and biological monitoring that is undertaken by SEPA on the Piltanton Burn, it is evident that great improvements have been made in the environmental quality of the catchment in recent years. The establishment of buffer zones and fencing of the burn will have made a positive contribution to both the biology and chemistry of the system but there has also be an improvement in terms of environmental awareness amongst the landowners on the catchment. This is partially due to the current climate of environmental awareness within society but is also a direct result of better interaction between farmers and fisheries interests (such as the DAC/GFT) as well as improved dissemination of advice and regulation by the environmental regulator, SEPA. The adoption of good practice codes (such as the Prevention of Environmental Pollution from Agricultural Activities) is also likely to have assisted with reducing pollution events. Recent changes to agricultural subsidy schemes (Single Farm Payment Scheme) which require farmers to adhere to various statutory environmental regulations (such as those on pollution control) in order to receive their subsidy, are also likely to have improved the situation.

Whilst much good work has been done, it is vital to encourage the continuance of these working relationships for the benefit of the system. Some changes in the way that the Burn is monitored biologically will occur under the Water Framework Directive, with other organisms (such as diatoms and macrophytes) also being monitored. Whilst the exact methodology of the biological monitoring is not yet available, it is clear that SEPA will continue to play a vital role in the monitoring and protection of the Piltanton Burn.

There are still areas of the burn where improvements can be made and the only way in which these areas can be tackled in by ensuring that all parties with an interest in the burn are involved in consultation from the outset. High risk activities such as dredging continue to threaten the burn's fish population and it is only by working together that these issues can be addressed and better environmental options found.

5.2 Fishery

The fishery has been managed by the DAC since 1975 and the club remains actively involved in the system, despite a decrease in membership numbers. From the data reviewed in this document, it appears that there is evidence of a decline in sea trout numbers within the catchment. This concern is also supported by other fisheries interests across the Solway region. Whilst it is not yet clear what the cause (or causes) of this decline may be, it is clear that detailed fishery data is required to allow the fishery to be monitored.

Suggestions for the future include improving the number of catch returns submitted to the club each year. Catch returns provide a wealth of information on the fishery. Information such as date of capture, size of fish (length and weight, if possible) sex and

place of capture can be very useful. Even more useful, in comparing the total fishing effort each year, is the amount of time spent fishing. This may also include days when no fish were caught. Other useful information can include any marks (such as predator marks) or parasites (such as sea lice) which may be present on the fish. It is also important to record catch information even if the fish is then returned to the water unharmed under a 'Catch and Release' scheme. It is useful to have records of all fish caught – sea trout, salmon and brown trout.

Catch returns are notoriously difficult to collect in angling clubs. One way in which the submission of catch returns can be improved is by using an incentive scheme, such as offering an entry into a prize draw if returns are submitted. It may be possible to engage with one of the larger tackle manufacturers (such as Sage or Orvis) and request a donation to use as a prize. Drawing the winner at an event such as the club AGM may also boost attendance numbers.

Scale samples are also of particular use in assessing a fishery. Scales can provide detail of the population structure and can also give an indication of growth rates. If collected carefully, the scales can be preserved and stored for many years as a historical record. This may be of interest if it is thought that growth rates have changed during a certain period.

The reduction in angler numbers is also something that should be addressed. Whilst the members that are currently in the club are more than capable of looking after the system at the present time, it would also be beneficial to undertake a recruitment drive to attract younger members. This would help to assure the burn's future and would allow the current members to pass their knowledge of the system on to fellow anglers.

5.3 Fish trap

The fish trap records have been very useful in assessing the abundance of fish during the spawning run, something which catch records may not be useful due to the fact that some fish arrive in spawning burns after the fishing season has finished. In order to make the best possible use of the fish trap data in the future it would be useful if the records could state the date, species of fish that was caught, the sex of the fish and the weight of the fish. The other information that is currently being collected, such as the date that the trap is placed in the burn and the date that the trapping ceases, should continue to be collected.

It may be worthwhile considering the attachment of a permanent temperature data logger within the Chlenry Burn. This would provide an indication of the temperature profile and, again if this was maintained over a period of time, would allow historical temperature records to be collected.

5.4 Electrofishing surveys

The electrofishing surveys that have been undertaken by the GFT since 1990 continue to provide an invaluable record of the Piltanton Burn's fish populations over time. It is vital that these electrofishing surveys continue in order to monitor the juvenile salmonid populations of the burn. These surveys may be particularly important in light of the current sea trout decline that is being experienced across the Solway region. Whilst other Solway systems may also contain sea trout populations which are monitored

regularly, on many of these systems salmon are also present and therefore monitoring must take competition between the two populations into account. The Piltanton Burn is unique in this sense as it only has a very low density of juvenile salmon present within the system and can be considered to be a better 'control' population for sea trout than the other Solway rivers.

5.5 Habitat works

One of the key recommendations of this review if that a full Scottish Fisheries Coordination Centre (SFCC) habitat survey of the Piltanton Burn should be undertaken as soon as possible. Currently, much of the information that is known about the Piltanton Burn is confined to areas which are accessible from the road and relies on the observations of anglers or those undertaking monitoring. There are large parts of the catchment about which very little is known and it is possible that these are areas where resources should be being directed. SFCC surveys have previously been used within Dumfries and Galloway and have been very successful in focussing attention on areas where salmonid production is limited by some factor. Undertaking a habitat survey would greatly increase knowledge of the catchment and would allow targeted habitat works to be undertaken.

During the Advisory Visit, some recommendations were made. At the Chlenry Burn, for example, it was suggested that selective removal of branches overhanging the site may be beneficial in allowing more light penetration. In the lower reaches of the burn, the fence adjacent to the burn could also be repaired. Downstream of Barnultoch Bridge, Japansese knotweed was present. It was recommended that this invasive plant was controlled using an appropriate method as soon as possible. On the Garthland Burn, a metal screen was found to be obstructing the burn and it was recommended that this screen should be removed. The bankside vegetation in this area could also be managed.

5.6 Burn diversion

The area near Torrs Warren where the burn had been re-routed was highlighted by DAC as being of particular interest. The club are keen to investigate whether the burn's original course could be reinstated in this area. As mentioned in **Section 4.1**, there are many considerations which would have to be taken into account in this project. It may be possible to undertake a feasibility study to evaluate whether the benefits of the project are enough to outweigh any potential problems. It is critical that SEPA and SNH are consulted at an early stage in any proposed study.

5.7 Stock Watering

As stated in **Section 4.2**, one of the main impacts on the Piltanton Burn is the presence of watering holes which allow cattle to access the water. During the Advisory Visit, problems were seen on the Chlenry Burn near the Forestry Pool in the lower catchment and also on the Crailloch Burn in the upper catchment. These spawning burns are important in ensuring the long term survival of the Piltanton Burn trout population and it is vital to ensure that they are protected. In some cases, most of the banks are fenced but the area around the watering hole is open to allow livestock to access the water. In other areas there is no fencing. The movement of cattle in the water, combined with the sandy geology, can result in silt being mobilised within the water column on a regular

basis which can lead to compacted substrates and increased turbidity. Cattle also have access to banksides where watering holes are situated which can mean that banksides become overgrazed, buffer zones are removed or lose diversity and the capacity of these areas to disrupt the route of diffuse pollutants is reduced.

A low cost, environmentally beneficial solution to the stock watering problem would have a huge impact on the biology of the Piltanton system. At the current time, the GFT are undertaking a preliminary study on the watering needs of the farms in the lower Piltanton during the different seasons and investigating what the options for alternative watering facilities (that do not involve using the burn) might be. There are a large number of cattle reared in the fields that adjoin the lower Piltanton (recent figures suggest 1400 cattle) and this means that a very large quantity of water needs to be available. Whilst this study is currently ongoing, it offers hope into providing a long tern, cost effective solution to this problem.

Appendix 1: Map of Piltanton Burn

Appendix 2: Summary of trout densities found during historical GFT electrofishing on the Piltanton Burn

Site	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000	
	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr
Greenfield	-	-	-	-	-	-	M	0	L	0	0	0	L	L	L	H	L	L	L	L	L	L
Crailloch Croft	0	0	0	0	0	0	M	L	L	0	0	0	M	0	M	0	L	L	L	0	L	L
Lochans	0	0	0	0	0	0	L	M	L	M	0	0	L	L	L	H	L	H	L	H	L	L
Between Lochans and WWTW	0	0	0	0	0	0	L	M	L	L	0	0	L	L	H	L	M	M	M	M	L	L
Bridgebank	0	0	0	M	0	0	L	M	L	L	L	L	L	L	H	H	M	H	M	L	M	L
Upstream bridge at Kilbrean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	H	0	H	M	H	0	H	0
Upper site Chlenry	H	H	H	H	H	H	H	M	H	H	H	H	L	M	H	L	H	L	H	M	H	M
Drumflower	L	H	M	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	M	H	H	H

Site	2001		2002		2003		2004		2005		2006	
	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr
Greenfield	L	L	L	L	M	0	M	0	M	L	L	0
Crailloch Croft	L	0	L	0	L	L	L	L	M	L	-	-
Lochans	L	H	L	M	L	M	L	M	-	-	L	M
Between Lochans and WWTW	M	L	L	M	H	M	H	L	H	L	M	L
Bridgebank	H	L	M	M	H	L	M	L	M	L	M	L
Upstream bridge at Kilbrean	H	M	H	H	M	M	-	-	-	-	-	-
Upper site Chlenry	H	L	H	M	H	H	-	-	H	0	M	M
Drumflower	H	M	M	H	H	H	M	H	L	H	M	M

Categories:

H = High
M = Moderate
L = Low
0 = None recorded

Appendix 2 (continued): Summary of salmon densities found during historical GFT electrofishing on the Piltanton Burn

Site	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000	
	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr
Greenfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crailloch Croft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lochans	0	0	0	0	0	0	0	0	0	0	0	L	0	L	0	L	0	0	0	0	0	0
Between Lochans and WWTW	0	0	0	0	0	L	0	L	L	L	L	L	0	L	L	0	L	L	0	L	0	0
Bridgebank	0	0	0	0	0	0	0	L	L	0	0	0	0	0	L	L	L	L	0	0	0	0
Upstream bridge at Kilbrean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	L	0	0	0	0	0
Upper site Chlenry	0	0	0	L	0	L	0	L	0	L	H	0	L	L	0	0	0	0	0	0	0	0
Drumflower	L	L	L	H	M	M	L	M	L	M	0	M	L	L	L	L	L	M	L	L	0	L

Site	2001*		2002		2003		2004		2005		2006	
	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr	Fry	Parr
Greenfield	-	-	0	0	0	0	0	0	0	0	0	0
Crailloch Croft	-	-	0	0	0	0	0	0	L	0	0	0
Lochans	-	-	0	0	0	0	0	0	0	0	0	0
Between Lochans and WWTW	-	-	0	0	0	0	0	0	0	0	0	0
Bridgebank	-	-	0	0	0	0	0	0	L	0	0	L
Upstream bridge at Kilbrean	-	-	0	0	0	0	-	-	-	-	0	0
Upper site Chlenry	-	-	0	0	0	0	-	-	0	0	0	0
Drumflower	-	-	L	L	0	L	0	0	0	0	0	0

Appendix 3: Juvenile Salmonid Population Densities (per 100m^2) Present During An Electrofishing Survey of The Piltanton Burn catchment during 2006

Site No	Watercourse	Location	Grid Ref	Date of Survey	Presence of Other Species*	Area Fished (m^2)	Density per 100m^2			
							Salmon Fry	Salmon Parr	Trout Fry	Trout Parr
1	Piltanton Burn	Downstream of bridge at Greenfield	204400 559600	1/11/06	S,E	98.26	0	0	>10	0
3	Piltanton Burn	Upstream of Lochans Village	206600 556700	1/11/06	S,E	110.8	0	0	>24	>15
4	Piltanton Burn	Between Lochans and sewage works	206700 556500	23/08/06	S,E	66.40	0	0	>68	>5
5	Piltanton Burn	Upstream of Culmick Bridge at Bridgebank	207600 556500	23/08/06	S	55.71	0	>2	>56	>11
8	Piltanton Burn, Chlenry Burn	Downstream Chlenry Farm	212700 560800	1/11/06	E,L	31.2	0	0	>42	>26
9	Piltanton Burn, Chlenry Burn	Under A75 at Drumflower	213900 577800	23/08/06	E,S,L	98.26	0	0	>46	>20

* Other Fish Species
S = Three-spined stickleback
E = Eel
L = Lamprey species