

**Wild Trout Trust Advisory Visit**

***Crag Lough, Hadrian's Wall***



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Ltd**

## Introduction

Crag Lough is of outstanding natural beauty, approximately 25 acres in size and situated right on Hadrian's Wall; it is owned and managed by the National Trust. The lough has been a fishery for some time, but let to local angling clubs, and now to a small private syndicate. The fishery is stocked with brown trout and rainbow trout. There are no native fish in the lough since it was twice killed in the 70's by use of Rotenone to eradicate an outbreak suspected to be Whirling's Disease. This was unauthorised and the fishing club was prosecuted. The current syndicate annually stock 200 brown trout up to two pounds in weight, and 200 rainbow trout up to four pounds.

The lough is situated in a very low nutrient landscape with a very small catchment area. There is one small feeder stream that extends for no more than a few hundred metres. The lough is surrounded by wetland and has been protected from agricultural inputs by the construction of a divert channel which was operated in times when nutrients were being applied. This has not been operated since the farm in question entered into an agri-environment scheme, which precludes application of nutrients. The divert structure may make access to spawning habitat very difficult for brown trout.

The National Trust wishes to bring the management of Crag Lough in house and make the angling more accessible to a greater number of people. Their fisheries policy ([www.nationaltrust.org.uk/main/w-management\\_freshwater\\_fisheries.pdf](http://www.nationaltrust.org.uk/main/w-management_freshwater_fisheries.pdf)) details the Trust's aspiration to promote the development of such fisheries in a self-sustaining manner.

The site visit was carried out with the National Trust property manager and a representative of the Tyne Rivers Trust, which is keen to facilitate any catchment restoration activities.



### **Restoring a wild fishery....**

This will be a challenging long-term project. The aim may, however be achieved in a number of small steps. The result could be extremely rewarding, with migratory trout having access right up to the lough in the future and a very successful small day ticket fishery.

Steps:

1. Cease stocking of non-native rainbow trout and allow anglers to keep any rainbow trout caught.
2. Identify suitable stock from which to rebuild a natural population.
3. Begin stocking with brown trout fry to work towards natural carrying capacity.
4. Construct an artificial spawning riffle in the inlet stream.
5. Open outlet channel to restore fish access from the Bradley Burn.
6. Work with riparian owners downstream to restore trout access throughout the Bradley/Chainley Burn system.

### **Step 1**

Rainbow trout are a non-native species and do not historically belong in the Crag Lough system. If re-connecting Crag Lough to the catchment becomes an objective, it

would be undesirable to increase the risk of rainbow trout escaping into the Tyne, although they are unlikely to have a noticeable impact. It would be prohibitively expensive to actively remove the fish in a stillwater of this size so it is probably best just to encourage their removal when caught by anglers.

## Step 2

Stocking the lough is possibly the easy part! Deciding where the stock should come from is another thing altogether. It is thought that the lough was connected to the Tyne catchment via the Bradley Burn. Trout from the Bradley Burn could be considered to be the most native stock from which to introduce. Is there a healthy population of spawning brown trout in the burn? Are there enough from which to take some? These are all questions that must be answered in consultation with the local Environment Agency and possibly through a small research partnership with the Tyne Rivers Trust. It may be that the Bradley Burn population is considered to be a part of the Tyne brown trout population as a whole and the EA could consider using some of their trapping facilities elsewhere in the catchment to provide some eggs from either wild brown trout or sea trout. It may be that the only option is to build a new 'wild' population from eggs purchased from suitable hatchery reared stock.

There are techniques for building cheap wooden temporary trout traps which can be used to monitor spawning trout in a burn, and if necessary catching them for egg stripping. This may be useful in this project and diagrams are included as an appendix. This could be used in Bradley Burn to identify if there are fish that may one day run up into the lough, or to capture some for egg stripping. Any trap would have to be checked daily throughout its operation.



The Bradley Burn below Crag Lough has excellent habitat throughout.

### **Step 3**

Once the source of fish has been identified and agreed with the EA, the next step is to introduce them to the fishery. Again, there are a number of options. The intention is to produce a self-sustaining population, rather than one that is reliant on annual stocking. Eggs may be hatched in a hatchery, and the EA do have facilities within the catchment for doing this. This may be a viable option if the EA is able to source eggs from the general Tyne brown/sea trout population. These would then be stocked as fed fry around the lough. If the NT end up sourcing the eggs themselves, either from a trap on the Bradley Burn or from a commercial source, then the cheapest option would be to operate an incubation box on the inlet stream. The incubation box takes a flow of water from the inlet stream and allows it to upwell through gravel in which the eggs are placed. Fry which hatch from the box can be trapped and counted before stocking or simply allowed to escape into the lough. It is obviously useful for management purposes to be able to count fry to monitor success. Anglers would hopefully start catching the small brown trout within two years of beginning this method, and success of juvenile fish should be monitored through anglers catch returns.

### **Step 4**

In order for a natural population to develop, spawning habitat is required. Suitable gravel with a flow of oxygenated water may exist in the lough itself but with no reports of juvenile brown trout in catch returns it is unlikely. The inlet stream probably provided suitable habitat at one time, but it has been straightened and channelised leaving very few areas, if any, for fish to spawn in. The bypass structure is also a possible barrier to fish spawning migration. It is possible to build artificial spawning habitat and this should be considered in the inlet stream. Without providing spawning opportunities, the lough will always be dependent on some kind of artificial stocking. An artificial spawning bed can be constructed in a stream of this size quite simply using wood, gravel and perhaps plastic pipework and porous membranes. Various designs exist and some examples are shown in the appendices but the general principle remains that a head of water is created by making a small weir and water is encouraged to flow through suitable size gravel. Good access to the spawning bed from the lough will also be required, as will good downstream habitat to protect juveniles from high levels of predation from fish-eating birds. Eggs may be introduced to the spawning bed by hand for the first few seasons, or until natural spawning is observed. It is possible that additional stocking using the egg incubation boxes may always be required to achieve a strong recruitment for the fishery. Any artificial structures in the inlet channel may provide additional opportunities to collect eggs from fish attempting to spawn naturally in what is a very limited space.



Inlet stream provides some good cover but the structure restricts access and work should be carried out to provide spawning habitat.

### **Step 5**

It is possible that stocks could be dramatically improved by restoring the access, which seems to have existed previously to the Bradley Burn. This will allow fish moving upstream to access the lough, many of which are likely to become resident in what is basically the largest pool on the burn! If any fish are likely to be the original wild stock for the fishery it is these.

The old access channel appears to have been blocked for no more than about 10 metres and there appears to still be enough groundwater flow from the lough to keep the stream flowing. There is evidence that the stream used to flow through a culvert in the drystone wall and fish friendly access would have to be restored both through the wall and the farm track. Accurate surveying would need to be used to ensure that the channel is the correct depth to maintain the required level in the lough. There is no need to include any kind of sluice or other structure unless it is desired to be able to vary the depth of the lough and this would probably be an unnecessary expense. Depending on the lough level, the channel may not flow at all times, but this would not be a problem to fish as they are only likely to be moving in times of higher flow.

### **Step 6**

In order for this small but potentially very productive fishery to be properly restored, the various barriers that exist along the Bradley Burn would need to be made passable to fish. The Tyne is famous for sea trout and it would be highly likely that the Bradley Burn used to support spawning sea trout, which would populate the burn with very high numbers of juvenile brown trout. Unfortunately, human activities have resulted in a number of artificial structures across the river that prevents fish from moving

through the system. This not only prevents access by sea trout from the main Tyne, it also prevents resident fish from moving and by fragmenting them, restricts spawning opportunities and makes the population very vulnerable to collapse by pollution, predation and exploitation. This is a challenge due to the fact that barriers will be in various ownerships, building fish passes or removing barriers can be expensive and are quite invasive activities. It would be ideal to include the Tyne Rivers Trust in this piece of work due to their catchment restoration objectives.



Barrier across the Bradley Burn at Vindolanda could easily incorporate fish passage.



Pipe bridge just upstream of Vindolanda may also require some work.

**Legal considerations:**

- Any works to the bed or banks within 8m of a river (including changes to existing structures, construction of fish passes and the installation of traps) require the previous written consent of the Environment Agency. In addition, the Agency's consent is required under the Salmon and Freshwater Fisheries Act 1975, for the introduction of any fish or eggs to any inland water, and the construction of any trapping facility
- This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, no liability or responsibility for any loss or damage can be accepted by Windrush AEC Ltd as a result of any person, company or other organisation acting, or refraining from acting, upon comments made in this report.

## Appendices

Diagram of spawning weir construction (courtesy of Windrush AEC)

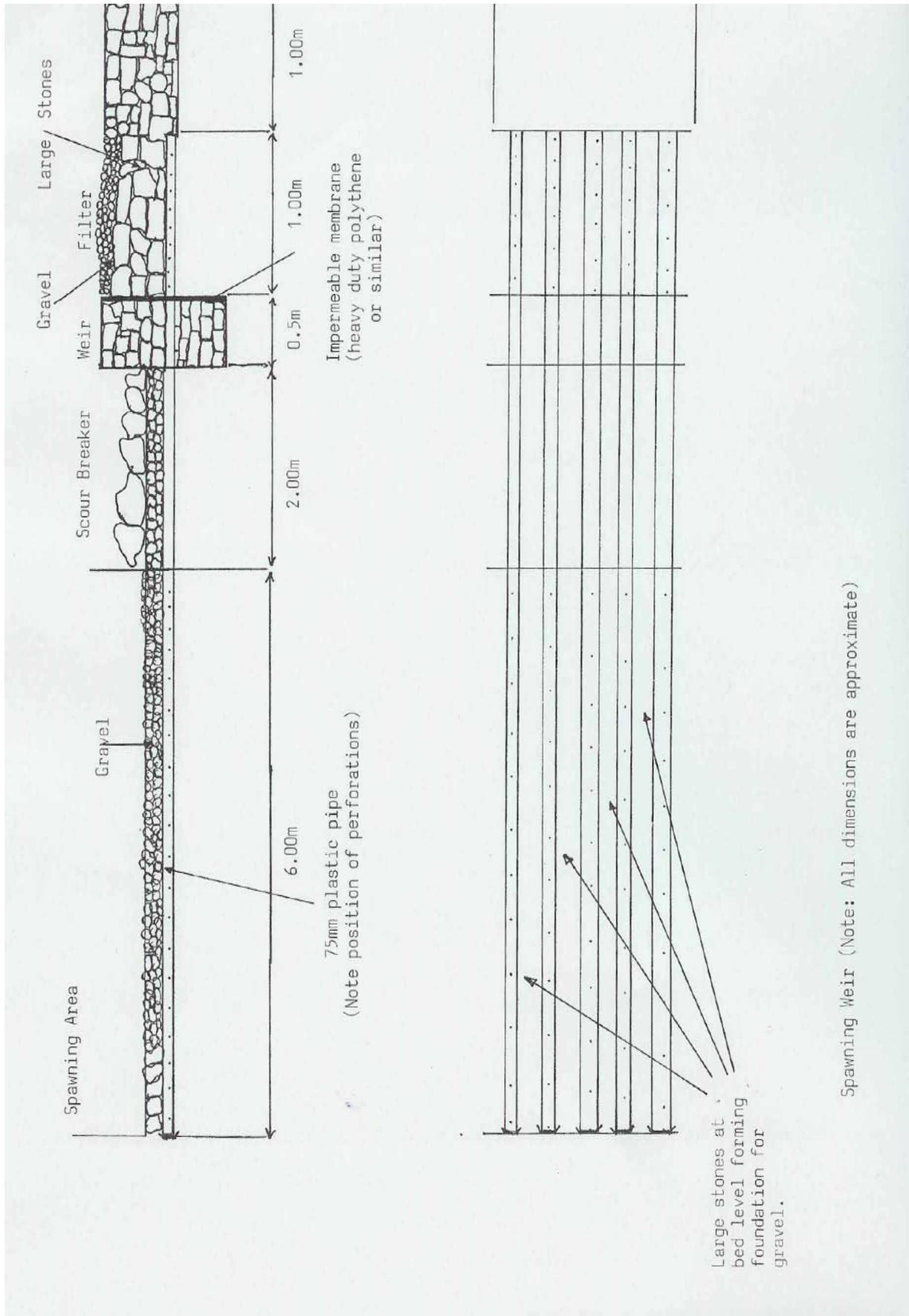
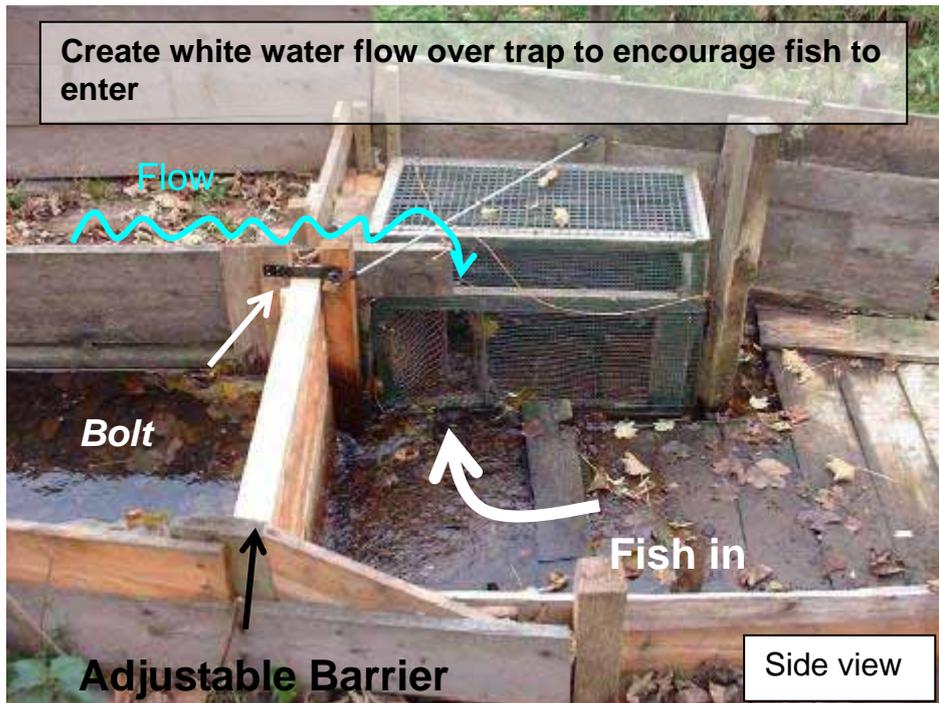


Diagram of temporary wooden trout trap (courtesy of Tweed Foundation & Eden Rivers Trust)



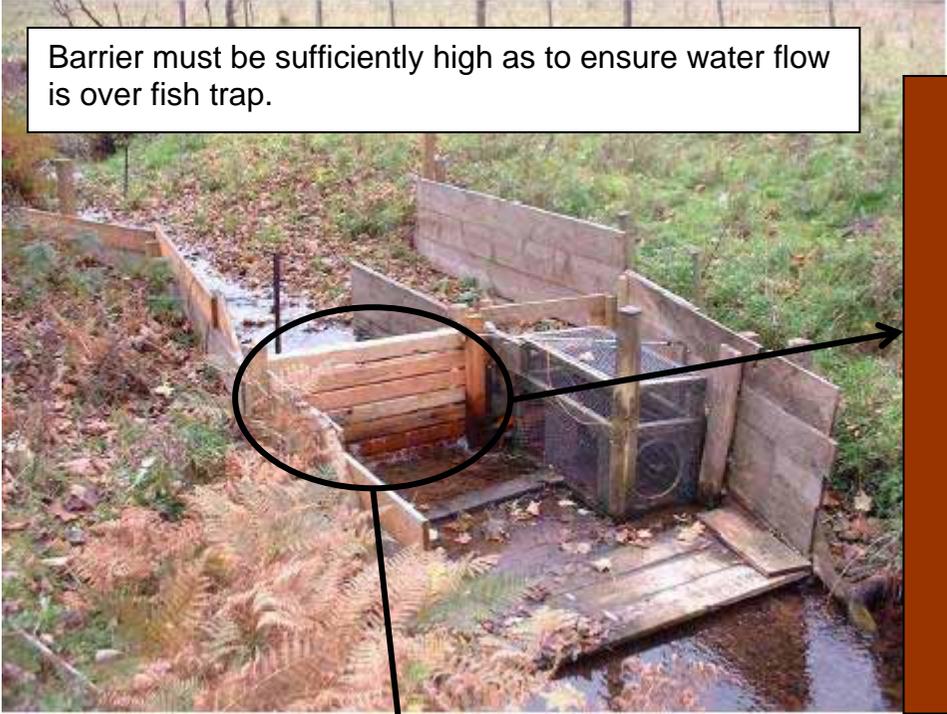


### **Construction of trout trap**

The pictures show a trout trap designed to trap trout as they migrate upstream. The trap is suitable for small streams no more than a couple of meters wide. The width of the trap should be approximately 3 times the width of the river. Naturally widened areas can be used for the site of the trap, or the area can be widened mechanically. This widened area helps dissipate spates. The floor of the trap should be flat (both in front and behind); this protects the riverbed from scour, but also creates a smooth flow, which prevents fish from jumping the barrier.

The barrier prevents fish from moving upstream and holds back the water. The result of this is that white water flows over the trap. It is this that attracts the fish into the trap. The barrier can be adjusted to form a dam during low flows, or to allow some flow through. The barrier is removable. During maintenance the barrier can be removed to clear built up leaves from behind barrier.

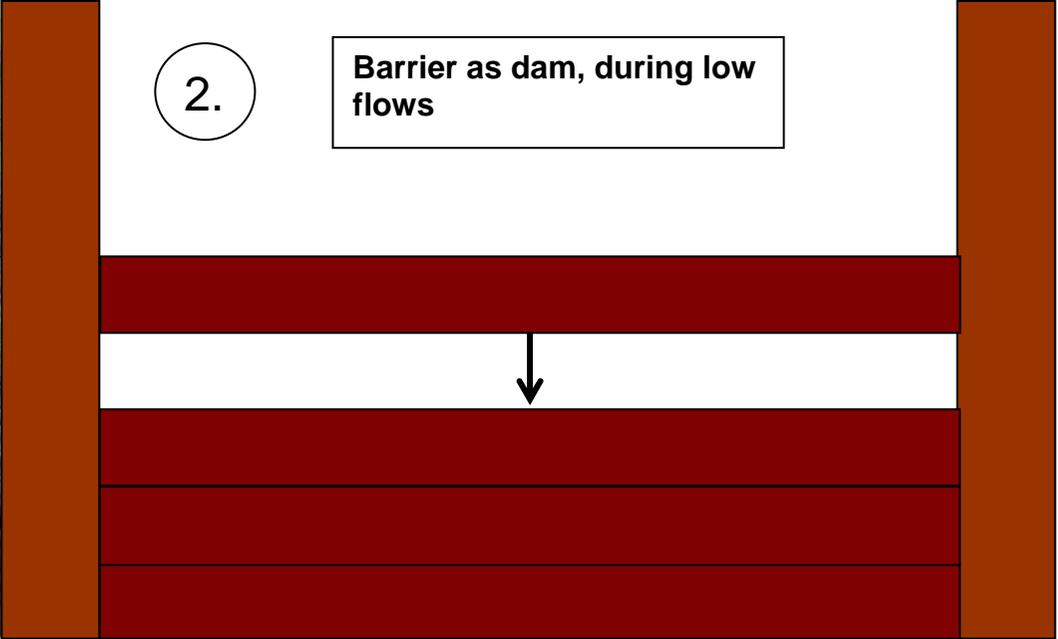
It is important to allow downstream passage for kelts.



Barrier must be sufficiently high as to ensure water flow is over fish trap.

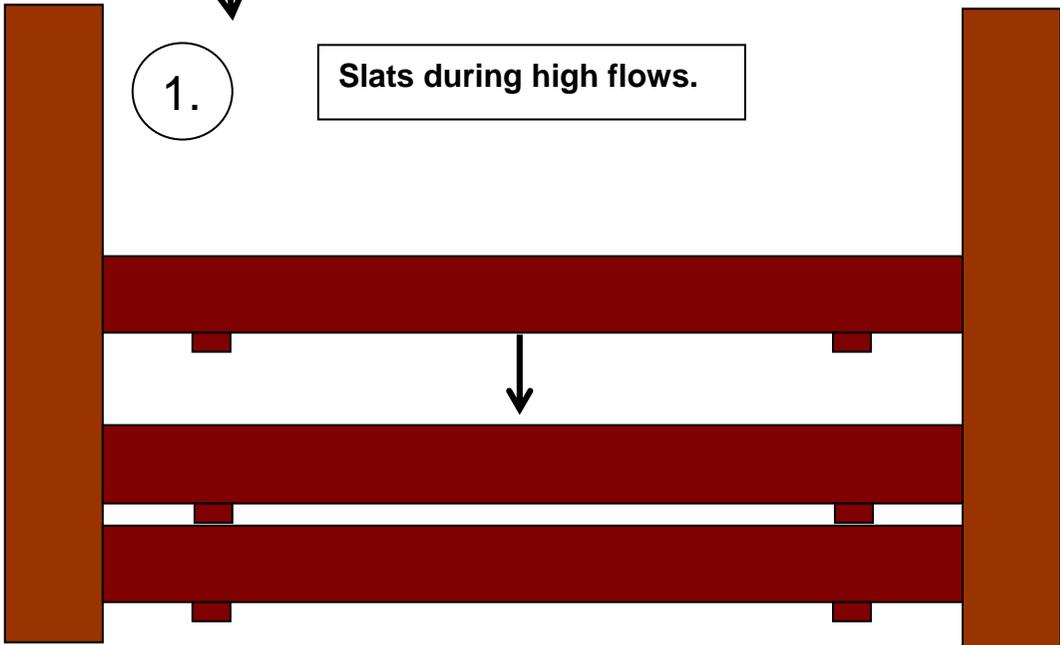
2.

Barrier as dam, during low flows



1.

Slats during high flows.



Construction of barrier. Ensure allowance is made for swelling of wood.

