Project Title: Self-regulating tide-gate: a new design for habitat creation

Project Summary SC070031/S

Habitat Creation Specialists from the Environment Agency have recently developed a new, patented self regulating tide-gate that can help to create or restore inter-tidal habitats behind flood embankments, which can provide a way to reduce/reverse the decline in this important habitat whilst maintaining the level of flood protection to people and property

Coastal and wetland habitats have been decreasing for many years and the loss is predicted to become worse as sea levels rise. The Government has set the Environment Agency challenging targets to create new BAP habitat, including a large proportion of inter-tidal habitats like salt marsh and mudflat. In addition, legal obligations under the Habitats Regulations require that direct and indirect losses resulting from flood risk management activities are mitigated.

Managed Realignment will help meet these targets but this tends to be on large sites that are not easy to find and require huge investment in time and funding. It may not be possible to meet the targets through managed realignment alone. Regulated Tidal Exchange (RTE) provides an additional method of creating or improving inter-tidal habitats.

RTE allows water to enter areas behind existing coastal or estuarine defences, while avoiding unacceptable increases in flood risk.

One way of achieving Regulated Tidal Exchange is through the use of self-regulating tide-gates (SRT) which typically involve the use a float to operate a gate valve that regulates the amount of water that can pass back onto the landward side of the defences.

SRT designs available to date have been of overseas origin (see photo), with little or no technical or other support available in the UK. The need to import gates increases their cost, difficulties with post construction support and carbon footprint

Self Regulating Tide-gate showing how the float allows a smaller flap to open as the tide rises

The Environment Agency has, through its Flood Risk Science R&D Programme, funded the development of a new design of self regulating tide-gate (SRT) that will be available without restrictions in the UK. Key criteria for the generic design were that it:

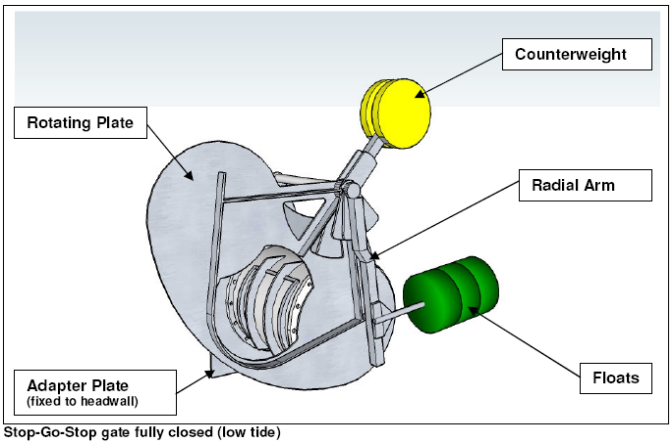
- is fail-safe and can be applied to existing outfalls
- can be produced at reasonable cost by UK manufacturers
- can operate automatically without the need for any power source
- requires a minimum of attendance and maintenance
- is applicable to a range of tidal and fluvial locations
- will facilitate fish passage

The project has resulted in an innovative float operated rotary valve that can be adapted to suit a wide range of site specific conditions. The gate can also be adjusted on site to control the amount of water allowed into the floodplain which will help to control the type of inter-tidal habitat that will be created.

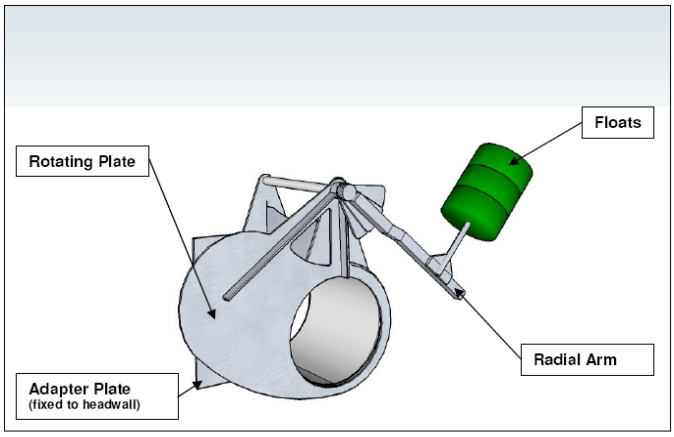
The rotating valve has two variants: -

- Stop-Go-Stop which is designed to be closed at low water levels, it then opens as the tide rises and closes again as the tide rises further.
- Go-Stop which remains open at low level and closes as the tide rises.

The precise levels of opening and closing can be easily adjusted to suit the particular site.



Stop-Go-Stop gate fully closed (low tide)



Go-Stop gate fully open (low tide)

This report is intended for Environment Agency staff, Local Authority staff, Land Owners as well as environmental bodies such as RSPB, National Trust, Natural England and Internal Drainage Boards.

Users will be able to determine whether a RTE/SRT approach would be suitable if they are looking to create or improve an existing inter-tidal habitat. It illustrates how to alter the generic design and make on site adjustments to manage the amount of water that floods the inter-tidal area.

The report provides information on two case studies and describes how the first installation has operated in its first year. It illustrates how the design was adapted to suit the second site following this first trial but also shows how the overall design can be adapted to suit other sites. It also describes how the new designs meet the original criteria set out for the project

Finally the report poses a number of questions which will help the reader determine whether a SRT should be considered if they are looking to create/improve an inter-tidal habitat.

The rotary SRT was designed by the Environment Agency and Stoneman Engineering and fabricated and installed by Stoneman Engineering. The Environment Agency has applied to patent the design to prevent commercial exploitation of the design by others in the UK. However, the aim is for the design to be widely used for the creation of new wetland habitat with the SRTs being produced locally under licence by suitably experienced fabricators.

This summary relates to information from project SC070031, reported in detail in the following output(s):

Report: SC070031/R
Title: Self-regulating tidegate: a new design for habitat creation

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